WILLIAM WALKER.

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# "PIONEERS OF THE PLANTING ENTERPRISE IN CEYLON."

*(Second Series.)*

## WILLIAM WALKER:

### MERCHANT AND ENGINEER:—1854—1891.

[The result of our application to Mr. Edmund Walker for such particulars of his father's life as would enable us to include a notice of his career among the "Pioneers of Ceylon," was that our good friend set to work and prepared in booklet form a most interesting though brief biography intended for private circulation, but allowing preference of selection for the *Tropical Agriculturist.* The little book, we must add, is got up in the first style of the printer's art, and besides the same portrait of Mr. Walker as we give, it includes an exquisite reproduction of "Doune Castle from the Bridge of Teith," near which Mr. Wm. Walker's youthful days were spent. The booklet also includes quite a selection of the verses by "Brown Palmer" and "Sandy M'Alpine," under which sobriquets the late Mr. W. Walker wrote freely in the home press and to the *Ceylon Observer.* The biographical notice is introduced as follows:—

"In the exceedingly interesting volume already published under the title of Pioneers of the Planting Enterprise of Ceylon, the proprietors of the *Ceylon Observer* have been good enough to include a sketch of the life of the late John Walker, and it seems fitting that this should be followed by a brief outline of the life of his brother William, who for so many years was associated with him in developing the business known all over the colony as "Walker's." The wo brothers, who for so long were united in business, were not long separated, John being taken 'Home in October 1889 and William in June 1891."

We now give our summarized selection from Mr. E. Walker's fuller notice, only regretting that exigencies of space prevent our appropiating more ot the very interesting record of good work appertaining to one of the most esteemed of Scottish worthies connected with the annals of Ceylon as a British Colony:—Ed. *T.A.*]

WILLIAM WALKER was born in Doune, Perthshire, Scotland, in 1824, and attended the village school there. At an early age—for his parents were not in a position to keep him long at school—he entered the office of the Deanston Works, where he worked for a number of years, and was fortunate in having as his master the late Mr. James Smith, who did so much for the people of Doune, and whose name is still remembered affectionately by a few of the older people. During this time, being eagerly deter_ mined, like so many Scottish lads, to push his way in the world, he continued his education by attend-

ing evening classes and neglecting no opportunity for improving himself. He was fortunate in having the help of his schoolmaster, who was interested in the lad, evidently recognising that he was "a lad o' pairts" and might do the "dominie" credit yet. This insatiable thirst after knowledge followed him all through life, and we find him at fifty years of age learning French, and at sixty taking lessons on the violoncello, which he played with great taste and feeling, for his soul was full of music.

It was only natural that one of his ambitious spirit should soon begin to look beyond the horizon of his country village, for he was aye "biggin' castles in the air," and Doune did not seem to offer sufficient scope for his boundless energy. So in due time he consulted Mr. James Smith, and that good man gave him every encouragement, with the result that he went up to Glasgow to mix with the busy throng there. By-and-bye he got an appointment in the Calico Printing Mills, Thornliebank, near Glasgow, under the late Mr. Walter Crum. About this time, in the year 1842, the five brothers, Duncan, James, Ebenezer, John and William, all met together in Glasgow; but that meeting was never repeated, and now they are all gone with the exception of Ebenezer, who, after thirty-eight years' faithful service in the great ship-building firm of Randolph Elder & Co. (now The Fairfield Ship-building Co.), Glasgow, retired in 1881, with remarkable expressions of good-will from the heads of the Company, and is still hale and hearty, though now in his eighty-fourth year.

In June, 1846, when only twenty-two years of age, William married Ellen Fortay, daughter of James Fortay, of Inverness, who for many years commanded the revenue cutter *Atalanta*, and was engaged in looking after smugglers on the west coast of Scotland. It was an early age at which to marry, and many people would say a very foolish thing to do for a young man who had yet to make his way in the world! But William had confidence in himself, and felt that, given a chance, he would get on all right. Besides the wisdom or otherwise of such a step depends very largely on the choice the young man makes! The reverence and affection in which the widow is held to-day by all who know her, and most by those who know her best, testify to the fact that the choice in this case was a wise one.

The next important step in the life of William Walker was when he entered the firm of Messrs. Wilson, James & Kay, now Messrs. James Finlay & Co., of Glasgow, and Messrs. Finlay, Muir & Co., of Calcutta, Bombay, and Colombo. It is interesting to note that while in the service of this firm he worked alongside of Mr. John Muir, who afterwards became Lord Provost of Glasgow, and is now Sir John Muir, Bart. Both young men were fortunate in having as their master one of the kindest-hearted of men—Mr. Alex. Kay—who years ago retired from the firm, and who, though now a very old man, still lives in his beautiful country seat at Biggar in Lanarkshire. William Walker was building up his character, on which alone, coupled with hard, conscientious work, he depended for his success. He had no other capital, and no influence to secure advancement. ; [but then "Character" is the most truly, permanently valuable thing in the world?—Ed. *T.A.*]

The time had now come when William Walker thought he might start on his own account in the cotton-yarn trade, then one of the most flourishing trades in Glasgow, and the one for which his past training had specially fitted him. He received a fair measure of support, and would no doubt have prospered but for an unfortunate event—an event which was a sore trial to him at the time, though it was just one of those influences which made for the establishment of his character. Through the failure of Messrs. Blank & Co., cotton-yarn manufacturers, with whom William Walker had an account, he met with a great loss, and it became necessary for him to compound with his creditors. With one exception, he received great sympathy from those who suffered through him, and they did not hesitate to show it the day they met in his office. Mr. Alex. Kay was at that meeting, and such was his estimate of the character of his former assistant that he ventured at the meeting to say, "I may not live to see it, but I feel sure of this, that if Mr. Walker is spared he will pay up this debt." And Mr. Kay's confidence was not misplaced, for from that date it became the life-work of William Walker to pay off everything due to his creditors. It was a long effort, requiring great patience and much self-denial, for the claims of a large family were pressing on him; but his wife nobly seconded him in his efforts, and was able, twenty-five years afterwards, to rejoice with him when in 1875 he made the last payment. By that year every creditor had been paid, with interest at five per cent. per annum in addition; and thus was preserved unsullied the only capital with which he started—his good name. The creditors were anxious that public notice should be taken of an experience not too common in commercial life, and proposed to entertain Mr. Walker at a dinner, and have the proceedings published; but he begged them to take no such steps, as any public notice of what he regarded as merely the discharge of his duty would be exceedingly objectionable to him.

In 1854 William became the buying agent at home for his brother John, and established himself in Glasgow under the style of Walker Brothers. Later on, in 1862, he became partner with his brother in the Ceylon business, then known by the name of John Walker & Co. It was a small business in those days, but with the boom in coffee it was destined in due time to play a not unimportant part in connection with the history of Ceylon's planting industry. The following extract from a letter written by John from Kandy, Ceylon, to his brother William in Glasgow, gives a graphic account of the business in its early days. The letter must have been written somewhere about 1856.:—

"The buildings may be valued roughly at £400 sterling. The motive power for driving lathes, bellows, etc., is the Malabar cooly, as we have not water enough for the blacksmiths' troughs, and fuel is expensive! Our customers are among three hundred planters scattered over the Central Province. As a class I would call them good customers, but some are very long in paying. Our workmen begin work at 6 a.m. and stop from 10-30 to 12 noon, when they resume work until 5 p.m. I am usually in the place from 6 a.m. until 5 p.m., less three-quarters of an hour for breakfast, and same for dinner. We have generally employed twelve to sixteen carpenters, four blacksmiths, five or six fitters, three or four turners, four or five boys, and ten to twelve coolies. There is quite enough of opposition to us to ensure the planters fair terms. We have in Kandy another similar establishment, carrying on all our branches of business."

From the above it will be seen that the firm employed at that period from thirty-eight to forty-seven native workmen; and to-day the number is about twelve hundred, while other large concerns of a similar character have also been established in the colony. No wonder the brothers were a little proud of the business which they had seen grow up and develop in this remarkable fashion!

In 1864 William made his first visit to Ceylon, to take charge of the old business at Bogambra during the absence of his brother John on a trip home. While in Kandy his time was very fully occupied with business arrangements, and from a pencil diary which is in my possession I find that even then he recognised that Colombo must become the capital and centre of Ceylon's business, and proposed that the entire business should be removed to Colombo. But the time for this change had not yet come.

Estate after estate in the Central Province was being cleared and planted with coffee—preparing for the good time coming. "Mr. Turner has just sold his Hantanne crop for fifty-four shillings per hundredweight—a splendid price." So wrote John to his brother William about 1857; but in later years coffee-planters received more than double that price for their produce. "The highest level of prosperity was reached in 1868, 1869, and 1870, in each of which years the total exports of coffee exceeded a million hundredweights, of a value in European markets of not less than four millions sterling."* This "boom" in coffee kept all industries busy, and it became necessary to extend, not in Colombo, but throughout the leading planting districts. Branch establishments were started in Dimbula, Dikoya, Badulla, and Haldummulla. The life in these young districts was at first a rough one, and the assistant who was sent to take charge of the Dikoya branch, and who is now a director in the company, sometimes tells how his room above the store was furnished. His table consisted of a packing case, and his chair was a keg of blasting powder!

With this rapid extension of the Ceylon business, including heavy expenditure for stocks for the new branches, arose the necessity for a great deal more capital than the two brothers possessed; but the good name William had established in Glasgow, coupled with that of his brother John in Ceylon, enabled him to find all that was necessary. Satisfactory financial arrangements were made with Messrs. Blank & Co., and everything went on well until 1874, when William's faith was again destined to be pretty severely tested. For the sake of those young men who may read this record, the story ought not to be omitted; and it is due to Mr. Kay, who proved so kind a friend to his old assistant during all these years and to the end of his life, to mention it.

One day in 1874, just at the very time when Walker Brothers' account with Messrs. Blank & Co. stood highest, in consequence of the large advances required in connection with the establishment of the up-country branches, the senior partner of the latter firm called. He then informed Mr. Walker that, being well advanced in years and anxious to curtail all outstandings, so as to simplify his financial arrangements as much as possible, he would like Walker Brothers not to draw any fresh drafts on his firm, and hoped they would be able to run off the debt by taking up existing bills as they fell due. Mr. Walker, recognizing how much he owed to these financial friends, could only reply that to the best of his ability he would endeavour to carry out Mr. Blank's wishes. Though not knowing at the time where help was to come from, yet, being a man of strong, simple and devout faith, he felt that he would not be forsaken in this crisis.

When in his office one day at this juncture, Mr. Kay called, just to have a chat, and in a kindly way to inquire how his old friend Mr. Walker was getting on, though he knew nothing at the time of his trouble. Nor was the subject mentioned until, in course of conversation, Mr. Kay said, "I have been thinking I would like to help you, Mr. Walker, if there is anything I can do that would be a personal benefit to you. Now, would it assist you to have the command of a little more capital than you at present possess?" Mr. Walker then, for the first time, told the position in which his firm was placed. As the result of that interview Mr. Kay—after satisfying himself that the business was perfectly sound, full of promise, and only in need of more capital, and having perfect confidence in Mr. Walker—went to a leading Scotch bank and opened a credit in favour of Walker Brothers for all that was required, at an expenditure of a penny postage stamp! Needless to say that the prosperity of the Ceylon business has long since enabled the proprietors to dispense with that credit, and placed both houses beyond the need of any such help.

As already stated, Mr. Walker, as far back as 1864, contemplated removal to Colombo; but so rapidly did the business increase, both in Kandy and at the up-country branches, that further extension schemes had to be abandoned; and though in 1875 premises in Colombo were leased, and rent paid for three years, they were never occupied. By 1880, however, the collapse of King Coffee was placed beyond doubt, and it became necessary for the firm to turn their attention to other channels. At this time the grand breakwater for sheltering the Colombo harbour from the south-west monsoon was nearing completion, and circumstances all seemed to point at last to removal there. Accordingly, in 1881 the premises formerly occupied by the late Mr. Home, and known as "The Corner," were leased by the firm, and no time was lost in laying down new plant and getting the new workshops and stores ready. It required a great deal of faith to go on with this work, as the prospects of the colony at the time were about as black as could be. Planters of the highest standing up-country were being ruined, and the mercantile houses were coming down one after another, until the crisis culminated in August 1884 by the stoppage of the old Oriental Bank Corporation. It is, perhaps, not to be wondered at that amidst all this gloom, a Colombo merchant, when he saw in 1883 that, in addition to the workshops, a new foundry—the first in the colony—was being built, should exclaim, "Has Walker gone mad!" But every one was not of that opinion, for in July 1883 the *Ceylon Observer* wrote:—"It is well that when the time came for an era of new life to the port and trade of Colombo, the right men were ready to meet the crisis and provide its requirements. The names of Kyle, Grinlinton, and Walker & Co. will be honorably associated with the New Colombo which is rising as the result of the partial completion of the Breakwater, and the resort to Colombo of many lines of mail, passenger and cargo steamers."

* From "Ceylon in 1893," by John Ferguson.

Meanwhile, Mr. John Walker, who after more than thirty years of hard work in Ceylon, did not care to undertake the burden of further extensions, and had settled with his family in Stirling, decided to retire from the firm he founded, and an arrangement was come to whereby he agreed to take over the up-country places of business and carry them on under the style of Walker & Greig, leaving the Kandy and Colombo establishments to John Walker & Co. William Walker now became senior partner in the Ceylon business, as well as in that of Walker Brothers, who, after the opening of the Suez Canal, found it necessary to remove from Glasgow to London, and who, in addition to Ceylon, have now very large interests in South Africa. Although his home was in Glasgow, Mr. Walker frequently visited Ceylon, as he had no sympathy with "absentee landlordism," and desired to keep in touch with all, from his junior partners down to the office peons, who were engaged in the Company's service. Sometimes his family felt that he was not sufficiently strong for these visits to Colombo, and when the last trip was made, in 1889, I can remember Captain Bayley, who was struck with his appearance, urging him not to return to Ceylon, and concluding his remark with, "Remember the fable of the pitcher that went once too often to the well." But Mr. Walker loved Ceylon, and had a warm heart for the natives, to many of whom he was indeed a real friend.

Throughout his life William Walker was deeply interested in all schemes for the uplifting of those whom we describe as the "working classes." The term is very defective when we remember the number of masters, professional men, merchants, etc., etc., who work as hard as, if not harder than, the majority of our workmen. Still, it has its special meaning, and in that special sense I use it. He always deplored the struggles between masters and men, which have wrought so much mischief to trade and roused so much ill-feeling, destroying utterly the old kindly and personal relationship which used in many cases to exist between both. He had little faith in Trades Unions, which he regarded as in large measure involving the transfer of the men from one tyranny to another ; and when, as so often is the case, they deliberately go out of their way to sow discord between master and men, he considered their work diabolical. It was not in Trades Unions he saw hope for a better state of things, but in co-operation and profit-sharing, which in the later years of his life he advocated, in season and out of season. I cannot give a better exposition of Mr. Walker's views on this exceedingly interesting question than by quoting from a pamphlet called "Christianised Commerce," which he wrote and published in 1888, as follows :—

"I am for freedom, not socialism. I am for freedom in our dealings with other nations, in our manufactures, in our merchandising, in our contracts between employer and employed. Freedom for every man to do his best for his own truest interest, and for the good of the community ; but freedom tempered and controlled by the teaching and example of Christ. I see no other solution of the pressing social troubles and difficulties of our day."

So earnestly did he believe in this as the right principle that he laid aside a portion of his own share in the business, the income from which was to be divided among those who contributed by their work to earn the profit. When on one of his visits to Ceylon in 1886 he was invited to meet some three hundred of the Company's employés, who presented him with a beautiful address, accompanied with a handsome desk made out of Ceylon native woods. In acknowledging the gift he said :—

"I desire as much to be your friend as your master. I think that the firm with which I have been connected so long as its head has done good work for Ceylon. We have brought works to the Island that were never brought before. We have also paid large amounts in wages every month to the Sinhalese and Tamil workmen. But we think we can go on a step further and do better. The first thing I will try to do for you will be to afford you medical aid in time of sickness. I wish also that some provision be made for any one who meets with any accident, or in cases of any protracted illness. The next thing I wish is that something be provided for our men when old age comes on and you are not able to work. If this is carried out, no old and steady worker in the Company's service will ever have to apply to the Friend-in-Need Society." The scheme thus formulated was carried out, to the great benefit of the workmen.

In the year 1890 Mr. Walker was persuaded to agree to the conversion of the Ceylon business into a Limited Company. For some time he had great misgivings about this step, as he feared the elimination of the personal element and dreaded the possibility of the business becoming a mere instrument for grinding out dividends for shareholders who had no interest in the concern beyond their shares. He was afraid that the government of the business by a "Board of Directors" would tend to blight personal responsibility, and was inclined to regard a "Board" in much the same way as Sydney Smith did corporations when he said "they had neither a body to be kicked nor a soul to be damned !" And so it was only under certain conditions he would agree to the change in the constitution of the business ; and one of these conditions was that certain shares, the most of which he himself provided, should be set aside, and the income from the said shares be devoted to the formation of a "Provident Fund." This Provident Fund meets all expenses for the workmen when laid aside through ill-health ; finds them in medical advice and in medicines ; and finally, when the men are too old to work, or permanently disabled, secures to them a small pension. From this fund thousands of rupees are thus distributed every year among the men, in addition to their wages ; and the members of the European staff also benefit by it.

In the preceding pages I have endeavoured to give some of the leading points in the business career of William Walker's life ; but it is only one aspect of the life, and probably he himself would say it was the least important, except so far as it was a "means to an end." For mere worldly prosperity he had supreme contempt ; but the joy of being in a position to "help lame dogs over stiles" was genuine, and many less fortunate ones have had cause to bless his name. He cared little for public subscription-lists, where people's names and contributions are advertised to the world. His belief was that if each member of the community, in a position to do so, were simply to attend to the cases that come across his or her path in life, then theer would be a tremendous reduction in the sum-total of human misery.

From his youth he was an earnest total abstainer from all intoxicating drink. He joined the Scottish Temperance League shortly after its formation. His name appears in the first annual 'Register' published by the League in 1849, where it has stood continuously year after year ever since. From 1853 to 1856 he was a member of the Executive, and was for many years, and up to his lamented decease, an honorary director of the Institution, He was a most liberal subscriber to the funds of the League, and in many ways sought to extend its influence.

Throughout his life Mr. Walker was always busy with his pen. When in the company of those who thoroughly understood him, and with whom he felt perfectly at home, he was the very life of the gathering, full of good stories, and able to sing with exquisite pathos our chief Scotch ballads. This reference to his singing leads naturally to a quotation from the most beautiful of all the printed notices published at the time of his death. It appeared in the *Ceylon Observer* of June 15th, 1891, and is greatly valued by the family. Between Mr. Walker and the proprietors of the *Observer*—the late Mr. A. M. Ferguson, C.M.G., together with his able partner and successor, Mr. John Ferguson—there existed a sincere and warm friendship. I quote from the article referred to as follows:—"Mr. Walker's love of music and song was intense, and those who heard his illustrated lecture in Colombo on Scottish Poetry, Music, and Song, will long cherish the memory of a great intellectual treat. His own performances as a singer were exquisite. Who that heard can ever forget his rendering of Lady Nairn's pathetic ballad, 'I'm wearin' awa', Jean,' and George Macdonald's Scotch version of the grand parable of the good Samaritan, 'Wha's ma neibor?' Who that heard and saw can ever forget the expression of voice and features, and the appropriate action of the truly artistic singer?"

In his youthful days William Walker must have worshipped in the parish church before the Disruption in 1843; and there is more than one reference, in articles written by him, to the Bridge of Teith Church, near Doune. But at an early period in his life he joined the Baptist Church, and for many years attended the Blackfriars Street Church in Glasgow, where he greatly appreciated the thoughtful and devout ministry of Dr. R. Glover, then a young man, but now (of Bristol) one of the leaders in the Baptist community. During the later years of his life he attended the Hillhead Baptist Church, where the Rev. F. R. Robarts still carries on a most successful ministry. Though a Baptist by conviction, yet in religion, as in all other departments of life, he claimed for himself, as he allowed to all others, the utmost freedom; and so we find him equally at home among Nonconformists of different denominations and Evangelical Churchmen.* Not only was Mr. Walker actively engaged in Church work at home, but he took a great interest in missionary work abroad. He never visited Ceylon without devoting a great deal of time to this work, going right round the Island on one occasion, in order that he might see what was being done at the different mission stations along the coast. In 1886 he made a special trip to Bombay and the north of India to get some knowledge of the missionary work carried on there, especially in connection with mission schools and colleges. How best to work our missions and utilise the consecrated energies of our missionaries must always give anxious thought to all who are truly interested in the work, but anything like dogmatic assertion on these points must be left as the "prerogative of the passing tourist," to use the delightfully sarcastic phrase of Dr. Copleston, the devoted and able Bishop of Colombo. Mr. Walker wrote a number of very interesting letters to the *Ceylon Observer*, giving an account of his trip to India, and we may contrast his calm and judicial remarks with the extravagant utterances too often made by the "passing tourist." Thoughtful men cannot but realise that our missions in India and China, where the people are steeped in elaborate religious systems older than our own, present many a "great and perplexing problem"; but Mr. Walker felt very strongly that it was most unjust to abuse the missionary. Let those who sneer at the results of their work and the apparently slow progress that is being made, devise a more excellent way, and prove their earnestness by paying for the experiment.

In politics Mr. Walcker was a staunch Liberal until April 8th, 1886, when Mr. Gladstone introduced his Home Rule Bill and broke up the grand old Liberal party that included such men as Bright, Chamberlain, Lord Hartington, Foster, Goschen, and many others. Bright and Foster are no longer with us, but the others are among the men who are today making this country's history, and many old Liberals feel it is a pity they had to go to the other side to do it. For the whole of his life, Mr. Walker, of the House like many others, almost worshipped Gladstone and when the crisis of 1886 arose, he felt as if he had lost a personal friend. He had taken his share in fighting for the different Liberal measures of a whole generation, but I do not think he even voted after 1886.

When he did take a holiday his great pastime was burn-fishing, of which he was enthusiastically fond; and then he was like a boy just let loose from school. His whole soul responded to the beauties of nature, and he seemed to find and see God everywhere.

Such is a brief and all too imperfect record of the career of one who, beginning life in a Scotch village, sought to live to some purpose, and with good effect, to make the most of what ever talents he possessed. He humbly but earnestly believed that for those who seek to do what is right "God shapes the fitness of us all, and gives to every man his meaning." Life for him was full of meaning, and the meaning of his life to those who come after him becomes the richer and more beutiful as the years pass by. It is something to make the little corner of the world in which a man lives the better for his being in it; and that is what Mr. Walker managed to do.

* One of many interesting experiences in Mr. Walker's life was that which brought him through temperance work, in contact with an earnest but extremely High ritualistic clergyman off City Road, London, who begged of him to come and give an address to his people. When the occasion arrived, and Mr. Walker watched the procession passing to the hall and all the symbols and forms accompanying the opening service, he felt far from comfortable and honestly stated how widely apart belief and practice were from all this, and then went on with his address in which he introduced one or two pathetic Scottish ballads. After all was over and the audience gone, the ritualistic clergyman came and shook hands beaming all over and exclaim out of a full heart to Mr. Walker:—"I do love you!" Wide as the poles asunder, denominationally and doctrinally, and yet *brothers*!—Ed. *T.A.*

A few months after his death the clerks and native employés presented the Company with a very good and handsome oil painting of their late master to be hung in the office. After the presentation the manager, astonished at the costly character of the work, expressed to the chief clerk, who headed the movement, his fear that the cost must have been more than the men could well afford from their pay. It was then explained to him that at first it was proposed to levy a percentage from the pay of each of the workmen and staff. "But we thought," said the clerk, "that Mr. Walker would not like that, as it would seem like forcing contributions. So last pay day we placed a box at the gate for the men to put in it whatever they felt inclined to give; and we got more than was required." Nothing could have been more in harmony with the spirit of him who was so long their master, and it shows that even the native clerks had caught something of the spirit of his teaching.

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There is a little thatched cottage occupied by a small farmer or crofter in the West Highlands of Scotland. A merchant from Glasgow one summer, when on a holiday, visited the cottage, and on looking round the parlour was surprised to see on the mantelpiece a photograph of Mr. Walker.

"Do you know Mr. Walker?" asked the merchant.

"O yess," replied the farmer's wife, with the sweet Highland accent; "he used to bring his family here for the holidays when the children were young. He *iss* a good man."

"Yes," said the merchant, as he looked again at the photograph, "there is no better man walks he streets of Glasgow."

* * *

"When I die, put near me something that has loved the light, and had the sky above it always.' These words express exactly the feeling of Mr. Walker, for though death had no terror for him he often said that he hoped he would never be buried in a city cemetery—like the Glasgow Necropolis—where flowers cannot grow and Heaven's light is for the most part of the year made dim with the dark canopy of smoke overhead. And so, on June 16th, 1891, he was laid to rest in the little country grave-yard belonging to the parish church at Cathcart; "until the day break, and the shadows flee away.'

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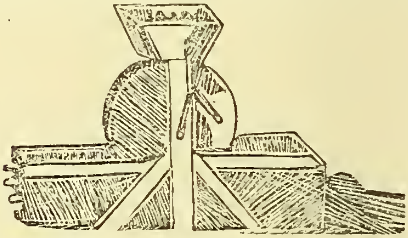
So passed away in his 67th year, one of the truest and best men who ever came to this Colony of Ceylon: his "pioneering" in one direction alone led to the expansion of industries with a staff under 50 to one of over 1,200 workmen, and he lived to see the usefulness of his Colombo and Kandy houses not only recognised all over Ceylon, but in India, the Straits Settlements, Java and Borneo as well as in far-distant Brazil and in the West Indies; while not a few ocean-going steamers have benefitted by the prescience which established the Colombo Iron Works. With these Works, the name of William Walker will ever be indissolubly associated, while all who knew him will acknowledge with us that a more single-hearted and altruistic Christian never lived:

"Only the actions of the just
Smell sweet and blossom in the dust."

## A HOME-MADE ARROWROOT MILL.

We were lately asked by a farmer in the Blackall Range how to make an arrowroot-grinding machine. He had arrowroot growing on his farm, and wished to make enough starch for domestic use. The only method he knew of was to grind down the bulbs on a large tin grater, but the results did not compensate for the labour. As we were once in exactly the same predicament, we cannot do better than describe the primitive machine which we invented, and which proved eminently successful. Being far distant from any place where a machine could have been constructed, not to mention the detail of a scarcity of cash, we constructed the machine as follows:—First, a log about 2 feet in diameter and 8 feet long was hollowed out by axe and adze into a trough. At the head of this trough was fixed a framework much like the wooden stand of a grindstone. A large wheel was then cut from a sound log. This wheel was about 3 feet in diameter and 1 foot wide. Tin plates, turned into graters (which required frequent renewal) by punching holes in them with a nail,



were next nailed on to the edge of the wheel, to which a wooden axle was fitted. The wheel, when placed in position, turned in the water with which the trough was filled. Above it was a wooden hopper, through which the bulbs dropped on to the wheel. This was turned by a man with ease, and the grated bulbs went into the water in the shape of pulp and starch. The latter gradually settled at the bottom, and the pulp was removed with a narrowtined fork and also by hand. After a short interval to allow the starch to settle down firmly, pegs were withdrawn from the lower end of the trough, and the water drawn off. The arrowroot was then dug out of the bottom of the trough and passed through calico stretched over a tub. By stirring it round with the hand on the calico, and at the same time pouring water on it, the whole of the starch passed through into the tub, leaving the gross impurities behind. This operation was performed three or even four times, until the arrowroot was perfectly white and quite free from any foreign substance. After the last washing, it was placed on shallow trays and dried. With the machine described, we not only made sufficient arrowroot for our own use, but we sent a quantity home to our friends, and sold the balance in Brisbane at 1s. per lb. This was in the year 1863. Such a machine, however, would scarcely enable a grower to-day to make a profit out of arrowroot.—*Queensland Agricultural Journal.*

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## THE CULTIVATION OF CACAO IN MEXICO.

*(From a Special British Consular Report.)*

The tree that products the "food of the gods" (chocolate), "theobroma cacao" of Linnæus, "cacari," or "cacava quahuitl" of the ancient Mexicans, and "cacao" of the Spaniards, is a native of Mexico.

Long before the conquest, the Aztecs and other ancient Mexican tribes used the fruit as one of their alimentary beverages. They prepared a drink called chocolatl by mixing the seeds after having crushed them on the metatl, together with a fine corn meal, vanilla ("tlilxochitl"), and a species of spice called "mecaxochitl," and those that drank it were a picture of health, preserving handsome and vivid features even to old age. All nations subjugated under the Aztec eagle had to bring, among other valuables, a certain

number of bags of cacao to the place in the great Tenochtitla as an annual tribute to the Emperor. It was so highly prized amongst the ancient natives that in trade it was utilised as cnrrency among the lower classes.

The varieties cultivated were, namely:—The "quauhcahuatl," "mecacahuatl, "zochicucahuatl," and "tlacacahuatl." The beau of the last one was very small, analogous to the kind found at present at Soconusco, Chiapas. The fruit produced in Zoconochco, in the provinces of Tabasco and Chiapas was considered as the best.

The followers of Hernan Cortez endeavoured in vain to maintain the plantations then existing, but it is a well known fact that on the conquest of this countrv by the Spaniards agriculture and the industries then known retrograded to such an extent that the cultivation of the cacao as well as that of the cotton plant suffered so severely that both plants were reduced almost to a wild state. The conquered Mexicans were compelled to work in the mines and serve in slavery, and were thereby obliged to neglect their plantations. And as the conquerors were not versed in the culture the industry was nearly abandoned, and did not take a new life until some Spaniards started one or two large plantations in Choutalpa, Tabasco, a few years before Mexico threw off the Spanish yoke. Other plantations were estabished in different sections of Tabasco and Chiapas.

Chocolate, the product of the fruit, was first introduced into Europe (Spain) by the Spauiards from Mexico. .Portugal followed in the use of it; France and England did not appreciate its full qualities until the latter part of the seventeenth century. After the year 1778 it came into vogue in all the cities in Europe. Its alimentary virtues became more generally known, and Doret, a Frenchman, invented a hydraulic machine to manufacture it on a large scale. Since then all civilised nations have consumed this rich American product of Mexican origin, which, up to date, is not produced in sufficient quantities to meet the world's consumption.

This tree is found growing wild and in cultivation in the States of Colima, Michoacan, Guerrero, Oaxaca (districts of Jamiltepec and Tuxtepec), Chiapas (districts of Soconusco, Mezcalapa, Pichucalco, Simojovel, and Palenque), Tabasco, and central and southern Vera Cruz, where the elevation is from 100 to 1,200 fcet above sea level, but Chiapas and Tabasco are noted as being its home, the climate and soil there being more particularly adapted to its culture and development than any other portion of the globe.

The production of cacao in the year 1893 was 2,147,730 kilos., valued at $837,197. In 1870 the States of Tabasco, Colima, Chiapas, Guerrero, Michoacan, Oaxaca, and Vera Cruz had 569,795 trees in cultivation, producing au annual crop of 31,285 quintals, worth to the planters $782,125.

Cacao is an evergreen tree of medium size, which, if growu in a good soil and left to itself, will reach a height of 20 to 30 feet, and spread out to an extent of 10 feet or more on each side. At the height of a few feet from the ground it sends out three to six lateral branches ("horquetas") without any sign of a leading stem, and it is only when the branches are matured that a leader or leaders ("rama chupona") spring out from the side, and not from the centre of these branches. The leaves are smooth, alternate, lanceolate, pendent, of a deep green colour, 9 to 10 inches long by 3 inches across. The flowers are small, of a pale yellow or very light red colour, and they come off in a bunch from the stem, branches, and the place where a leaf formerly existed. It is rarely that more than one of them develops into fruit, and thus many more flowers are borne on the trees than fruit pods. The cucumber shaped pods are 5 to 9 inches long, and nearly 4 inches in diameter at their widest part, with a thick, almost woody rind. They are pinched in at the top and poiuted at the end, the point being curved to one side. The skin is first light green, then of a yellowish red colour, with ten furrows and tuberculated ridges. These iudicate a fivec-elled fruit, which contains on an average 38 seeds, embedded in its sweetish pulp.

The species most cultivated in Mexico are: Cacao or Theobroma ovalifolia, T. bicolor, and T. angustifolia. There are other kiuds known, generally found growing wild, which come under the head of the Guazumæ or guacima, Guazuma polybotrya being the principal species.

Practice and study have shown us that the cacao tree will thrive well in virgin lands recently cleared, but rich in organic matter and minerals, and as it has a long tap root the surface soil needs to be deep and thick with humus. The best soil, however, is that occurring in valleys and undulating lands, along the banks of rivers or streams made by years of alluvial deposits, or by the decompositiou of volcanic rocks. A proof of this is shown in the department of Soconusco, Chiapas. It will also grow well in loams and the richer marls, but it will not thrive in stiff, heavy clay.

A warm, moist climate, having a mean temperature between 76° and 77° Fahr., is necessary for the cultivation of cacao if large crops are expected, but when the soil is suitable, the tree will grow and give fair returns in a moderately dry or well drained location. The ordinary cacao plant will not do well in the mountains above 600 metres (1,968 feet), and even at that height it becomes stunted, and is fruitful only for a few years. The best elevation is from 300 to 500 feet, and in sheltered situations near the seashore good crops are to be obtained, but the tree will not thrive if exposed to the direct iufluence of the sea breeze. Cacao will not bear much exposure, hence sheltered lands and valleys should be selected and on the Gulf side of Chiapas, Tabasco, and Vera Cruz, nothern and eastern aspects should be avoided. Still, locations in Colima, Michoacan, Guerrero, and Oaxaca, on the Pacific side, having a south and south western exposure, must not be preferred for the formation of successful plantations.

Cacao plants are obtained from the seed, which germinates readily and quickly. The best looking pods from the April or May crop, which are not over ripe should be picked for the purpose. Those known as bechas are generally preferred by the planters. These are distinguished by their light colour, solid appearance, and the seeds not rattling inside. After selecting the largest seeds from healthy pods, the former are soaked in lukewarm water for 12 or 18 hours, rejecting those assuming a reddish tiut and likewise those floating on the water, the rest, are left to dry.

A virgin spot close to a spring or stream whose soil is not porous, in the immediate vicinity cf the plot to be planted, should be selected for the nursery. For the convenience of handling, more than one nursery should be formed along the plot, 300 feet distant, if a large sized plantatiou is to be established. The spot is prepared by hoeing the soil, extracting the weeds and roots and pulverising the earth with a rake; then beds are made 5 feet wide by any length, separating each one by a walk 3 feet wide. Small furrows are made, about an inch in depth and about 12 inches apart, and the seeds are sown in them 8 inches one from the other. That part of the seed attached to the stringy centre of the pod is the one to be placed downwards iu sowing. The seed is covered with vegetable mould or loose loam mixed with horse manure and over that banana leaves. The bed is sprinkled every day for 12 or 15 days, when seedlings appear. Then the banana leaves are removed, and sheds, made of palm leaves and sticks, so fixed that they can be raised as the seedling grows, should be placed over the nursery as shade and shelter; no weeds or grass are allowed on the beds.

The sprinkling should be continued when necessary, or on rainless days, and the palm leaves are gradually taken off, but uot altogether uutil the plants are ready to transplant. The operation of formiug the nursery is doue in some places in the months of April and May, and in other localities as late as September.

Either in the month of Febuary or March the planter's attention must be directed to the preparation of the land; iu some places, where the rains cease early in the season, that is done in December or January. The forests having been cut down (tumba) the brauches must be lopped and strewn (rozada) evenly over the ground before they are burnt (quemada). But when the forest is cleared, shade belts should be left, or afterwards planted in exposed places so as to shelter the cacao trees from the wind.

Of course the felled forest trees must be allowed to remain for a time exposed to the sun, otherwise the smaller branches will not catch fire properly. Where possible it is better not to burn the bush, but to pack it in lines between the young plants or madres, in order that, by its rotting, it may add to the richness of the soil, otherwise the nitrogenous compounds so beneficial to plant life are sent off into the atmosphere by the burning.

Immediately after the burning, which should take place in April, or a month after the land is cleared, corn and beans are sown on the plot. If the land has no natural trees suitable for shade, mother trees (madres) are looked for, such as mataraton, pito, cocoite, chipilcoite, and chontal. The lastnamed, a broad leaved tree, is not good for anything but to give shade and shelter. Cocoite and chipilcocoite, small leaved trees, are hard wood and are used by preference for posts for houses. These trees are obtained from forests in the shape of cuttings or young plants, and planted in the beginning of the rainy seasou and at a distance of from 15 to 18 feet apart on rich flat land, but on poorer soil and on hill sides, from 12 to 16 feet will be the proper distance. Rubber can also be plauted as shade, but it requires more scientific work and care. In July and August the corn and beaus are harvested, and the plot throughly cleaned; the banana suckers can then be planted between every for madres, providing rubber has not been thought of and no preparations made to raise it. In the spring of the following year another crop of corn can be sown between the madres leaving a hill close to the place destined for the cacao seedliug which will serve as chichihuas, temporary shade, to the young plant when transplanted. In Chiapas and Tabasco trees called challa and madre serrana are utilised for this purposes. A year after sowing, seedlings are 50 centims. (20 inches) high and ready to be transplanted.

In the beginning of the rains, on a cloudy day, the operation of transplanting is proceeded with. A peou with a machete cuts a square line around the seedling and with a spade (coa) lifts up earth and seedliug; this is done in 15 to 20 minutes. Then another peon wraps up the whole mass with a large leaf grown on a plant called hoja blanca, found in those sections. In the meantime the holes are being made, they are dug 8½ feet away from the madres if these are set 17 feet apart, so as to form a square with a mother cacao in the middle. The holes should be 2 feet square and 2 feet deep, that is 8 cubic feet of earth must be taken up, this can be done by a practical mau inside of 5 minutes, in soft soil. The earth around the seedling after transplanting must be well pressed with the foot, but at the same time, before finishing that operation, dried leaves are mixed with the soil to be placed on top.

Of course land under cacao cultivation, as under all proper and successful cultivation, should be kept clear of weeds. In the first place the plot should be drained off to ensure quick crops; and then proper tillage will improve the soil and do good to the trees. To accomplish this, 4 weedings (ladeas) are necessary in the first 3 years, 3 in the second 3 years, and 2 in the following years. On steep hill sides cutlassing will be sufficient, and on level places hoeing will be required. When the trees are grown so that their branches shade the land, the weeds will not grow very fast, and as a rule they are so loosely rooted that they may be easily pulled up. The cultivation and harvesting of the side crops must be attended to in due time. The cacao planter should give careful attention to the pruning of the trees and trimming of the madres if he wishes to get a large yield. As the pods are borne on the larger branches, the principle is to develop such branches by judicious pruning and to see that they are not covered up by a mass of foliage and small twigs. A typical cacao tree should have one stem, giving off at a few feet from the ground three to five branches which spread in an open manner and are free from leaves except at the top; thus the leaves shade the open inner portion without interfering with a free circulation of the air. If the young plants throw out more than one main stem, the surplus ones (mamones or chuponas) must be pruned off when the moon is on the wane, and after the lateral branches are formed no upward prolongation of the stem must be allowed to grow. If the tree be left alone these upward growing branches will come off from the stem just below the laterals, in the form of suckers, and to leave them on is to cause the strength to be taken from these fruitful laterals, as well as to allow the trees to run up, perhaps for 30 feet or more thereby causing much trouble in picking the pods. When the suckers are pruned off, fresh once will grow in a short time, generally in a month, so that the trees will require frequent attention until they are mature, when the tendency to throw out suckers will be stopped. In gathering the pods, the suckers may be taken off at the same time, but the trees should not be pruned in the flowering season.

Unless in the case of sickly plants on poor soil the trees will not require manuring until the crops are taken off, when, as may be imagined, it will be necessary to restore to the soil, iu a cheap way, what has been removed in the valuable produce. A good deal will depend on the nature of the soil and the yield of the trees. Should crops which were abundant be found to be falling off, it is an indication that mauure is necessary. A compost of yard manure and bone dust in the proportion of 5,000 cart loads of yard manure and 500 lb. of bone dust per hectare of land applied every 3 years is all that is required. The successful harvesting of cacao requires great care and watchfulness, as it is a fruit that has many enemies, the priucipal beiug parrots, squirrels, tusas (a species of gopher), tepeiscuintle, another animal of the rodent class, aud ants, specially those known under the name of arrieras. But damage by these can be obviated by proper cultivation and care.

Returns from a cacao plantation (motelar) cannot be expected until 5 years from trausplanting. At 2 years old the tree, in rich soil, stands 5 or 6 feet high; when 7 or 8 feet high it begins to bear (jugar), but it is not in full bearing (cuaja) until it is between 10 and 12 feet high. The first flowers under favourable conditions will come out at the third year, but, as the tree is not matured then, they should by no means be allowed to produce pods, otherwise the plant will be so weakened by the fruiting that its growth will be greatly checked. The first flowers, therefore, should all be rubbed off.

After the leaves of the flower fall, a bud appears like the common Mexican chile pepper and takes 3 or 4 months to mature. Peons or mozos must be employed daily until the crop is harvested, as birds and squirrels are apt to eat the bud and afterwards the seed. The cacao tree flowers all the year round and the pickings of the fruit are divided into four harvests or seasons. The first, which covers the first three months of the year, is known as invernada; the second, lasting through April, May, and June, is the cosecha or harvest proper, and is the most abundaut of the four; the product of the third, extending over July, August, and September, is known as cacao loco; and that of the three last months of the year as alegron.

The average yield of dry cacao from each tree of course varies very much. The limits may be said to be from 1½ to 8 lb. per tree. —*Sugarcane.*

## PALLEGAMA GRANT ESTATE.

Sportsmen occasionally find their way to the neighbourhood of Pallegama and we are glad to have independent opinions of the planting in some "Notes"—not from one of a recent party, but gained indirectly:—

"Pallegama has every appearance of being a very fine property in course of time: coconuts and coffee were looking very well indeed, though wild pig and buffaloes do a lot of damage to young supplies. But couldn't the hides and horns of buffaloes be turned into a 'New Product,' and add to the revenue of the estate instead of taking from it? The bungalow is a neat building on the top of a knoll, and has a cart road right up to the door. The whole distance from Matale is 47 miles, and sportsmen often go much farther than that in search of game."

## FRUITS AND VEGETABLES:

### HINTS FOR MR. WILLIS AND HIS STAFF: AS ALSO FOR ALL UPCOUNTRY (AND LOWCOUNTRY) RESIDENTS.

(*From a practical Colonist.*)

"THE TOTTUM, Sept. 14th:—Don't you think, Mr. Editor, that our energetic Director of Peradeniya Gardens would be conferring a boon on the whole community, if he were to train a staff of coolies that could be hired out as garden workers at so much per month just as gardeners are lent out at home. For instance, if any one wanted a garden laid out or one remodelled, what a convenience it would be to get a cooly who knew how to do it, even by paying a good wage for him!—and an ordinary estate cooly could keep a garden weeded and watered when once it was laid out; and twice a year, say, an experienced gardener from Peradeniya might be had, to put in fresh plants and seeds. The Peradeniya Gardens might do wonders in introducing new fruits that could be grown in our island. I am perfectly certain there would be much less fever in many districts were people to eat more fruit. Even plantains are not to be always had in planting districts, and if oranges, limes, pineapples, papaws, &c., were for sale at the Government Gardens, there would be a great demand for them, and I have often thought a good way of celebrating this year of Jubilee would be for every one in the island to plant 60 fruit trees (of sorts) near bungalows wherever such a thing was practicable. The expense would be trifling and people ought not to be deterred by the feeling that those who planted the trees might not reap the fruit of them. Let us all be disinterested for once in a way: some one will eat the fruit in course of time.

"I fancy the pineapple fibre you wrote about is extracted from the leaves, is it not?—we could grow tons of these. Papaws planted from seed come into bearing in about 10 months at an elevation of 2,400 feet. So papaw juice could also be produced in large quantities."

## NOTES ON RUBBER.

The *India Rubber World* of New York is starting a discussion as to the relative values of the rubber of different countries, and certain authorities seem inclined to make out that Para rubber trees are never to succeed in Asia, nor Africa rubber from the Congo ever prove as good as the rubber from South America. Even the latter proposition is improbable, while we have no faith in the former. Why should not Para rubber prosper well in moist warm Ceylon, just as much as Trinidad cacao has flourished in our upland valleys and Peruvian cinchonas on our hills? We quote from our American contemporary as follows:—

Any hope that rubber may be cultivated successfully in more favourable climates seems to us wholly unfounded. There is no higher authority on this subject than Mr. Mann, late forest conservator in Assam, who wrote recently in *The India Rubber World*: "The acclimatization of American rubber-trees in Asia has not been a success, and, generally speaking, I am now inclined to think that all rubber plants had better be grown in the countries in which they are indigenous." By the way, there is not, and never was, a large plantation of Para rubber-trees in India, although a statement is going the rounds in regard to such a plantation, said to cover 200 square miles. More than this, experiments made in Brazil have demonstrated that, while cultivated trees may flourish, they may not yield rubber on a different soil, or at a higher elevation, than is common to the native rubber forests. Thus it will be seen that the business of planting rubber should not be undertaken without considerable caution.

The cultivation of India-rubber, coffee, and pineapples together is proposed by the Mexican Gulf Agricultural Co. (Kansas City, Co.), incorporated under the laws of Missouri with $100,000 capital. Organized originally to start a coffee plantation in the isthmus of Tehuantepec, their plans have been extended until they now include an offer of 100-acre tracks, one-half planted in coffee and pineapples, and 4,000 rubber-trees. The idea is to attract additional capital and increase the number of persons interested in tropical cultivation. They claim to have several thousand rubber-trees on their lands already, and more will be planted. After eight years it is promised that the rubber-trees will yield yearly $1 each.

A despatch appeared in the New York *Sun* of July 12, dated from Oaxaca, Mexico, saying: "The India Rubber Company of Mexico, an English corporation with a paid up capital of $2,000,000, is going into the rubber industry in Mexico on an extensive scale. This company is now planting 5,000,000 rubber trees on their lands in the district of Pochutla, this state. They have 400 men at work on the land now."

Every increase in the demand for any grade of rubber tends to raise its cost to the manufacturer. Suppose, then, that certain African sorts should be found truly to yield a substitute for Para. How long would the present difference in price continue? There would be a steady rise in Africans until it would be economical no longer to use them instead of Para rubber. This consideration would soon put an end to any hope for great profits from substituting low-priced African gums for the higher priced sorts from South America. But it remains to be proved that the African rubbers are capable of such use as has been asserted. Of course great advance has been made in their manipulation, permitting their use in channels where, not so many years ago, it would have been impossible. It is reasonable to suppose that the use of Africans will continue to extend in new directions, but the experience of every manufacturer who has ever had anything to do with these sorts has helped to make him conservative.

It is not the question of how much rubber there is in Central Africa, or of how many laborers can be had. It is not even the question of transportation that is most important, but how the rubber is going to find a market. Para rubber always has been and always will be the mainstay of the rubber industry. There is a demand of course, for African rubbers, and this will grow, but from this time on it will be only in the same proportion as the rubber industry grows as a whole. When the limit to the demand for Congo—or any other—rubber has been reached, the production will fall off, and this is why I say

that we are not going to see such a great lot of Central African rubbers coming to market in the next few years as some other people think. Let the market once become overstocked with these grades, and prices will fall below the cost of producing and shipping them to market.

## AMERICAN TEA IMPORTS OF 1897.

The total imports of tea for the year ending June 30, 1897, were, from the countries named, as follows:—

| | Pounds. | Dollars. |
|---|---|---|
| United Kingdom .. .. | 6,212,008 | 1,165,765 |
| British North America .. | 2,547,371 | 396,738 |
| China .. .. .. | 56,483,924 | 7,281,931 |
| East Indies .. .. | 2,120,003 | 272,683 |
| Japan ... .. .. | 45,465,161 | 5,651,279 |
| Other Asia and Oceanica .. | 454,111 | 57,226 |
| Other countries .. .. | 60,597 | 10,240 |
| Total.. .. .. | 113,343,175 | 14,835,862 |
| Exports .. .. | 439,577 | 98,790 |
| Net imp'ts or cons'mpt'n | 112,903,598 | 14,737,072 |
| Net imports in 1896 .. | 93,340,248 | ........ |
| Increase .. .. | 19,563,350 | ........ |
| Consumption, 1897, per capita | 1.55 | ........ |
| Consumption, 1896, per capita | 1.33 | ........ |

Tea is the most talked-about article in the grocer's stock, and yet the total import cost of one year's supply is less than $15,000,000, and the retail cost less than $30,000,000. The trade is insignificant in comparison with other articles consumed, and yet it absorbs more attention than any other one article. It has always had a historical interest, a social connection; been in favour as a stimulant, and of interest to the grocer because it is a medium for generous profits.

The net imports, reduced to gallons of beverage, show a consumption of not less than 564,517,990 gallons, on a basis of five gallons of beverage to one pound of leaf. Some claim that one pound of leaf makes six gallons of beverage. When India or Ceylon tea is used, one pound of leaf will make from twelve to sixteen gallons of beverage, showing it to be the cheapest good stimulant in favor with consumers.—*American Grocer*, Aug. 18.

## THE TRADE IN ALOE FIBRE.

The *Indian Textile Journal* writes:—Few of our readers are probably aware of the increasing business that is now being done in the export of aloe fibre. There has been a continuous demand for the fibre from many parts of the world and it seems that if India can supply it in large quantities there will be a good future before those who will set to work and begin the export on a large scale. As it is, it unfortunately remains a neglected industry, in this country, but if once regular shipments are made and depended upon, a steady demand will be kept up. According to a correspondent, a visit to the press houses at Colaba would surprise many a capitalist in search of a profitable investment. Waggon loads of the fibre are sent down to Bombay from the growing districts by merchants or their representatives. It is forwarded either in bulk or in loose bales and on arrival is carefully sorted by the buyer, who fixes his price, which varies from R75 to R125 per ton according to the different qualities. It is then pressed into bales of the same size as cotton bales. The price delivered in London is reported to be from £5 to £17, so that a good margin of profit is generally left to the Bombay exporter.

India, like most of the Eastern countries possesses a great variety of fibres; but a very few of them are commercially useful. Aloe fibre grows wild in many part of India, the Bombay supply depending on the wild tracts of Central India, the whole of the Deccan and the Bombay Presidency, where on the coast of Kathiawar, and particularly in districts near Poona it grows in abundance. No systematic cultivation of the weed is yet attempted. Men, woman and children of the lowest caste pick the leaves in swamps and malarious bogs when they have no better occupation to follow. The work is alike unhealthy and injurious, as the juice of the plant causes itching of the skin, and in the case of sores of cuts the limbs have been known to swell. The families set to work in groups, and while some gather together the leaves and stems, the others strike the leaves, after they are dipped in water, against a stone, which operation separates the fibre from the leaves, juice, &c. This is the most primitive of the methods still followed in many districts, but of late several hand machines of somewhat crude design have been made by which the fibre is extracted. Having separated the fibre in this way, the natives attend the bazaar with their supply and part with their small bundles for a very nominal consideration in the shape of food grain or copper coins. The fibre is used in this country either pure or mixed with hemp or flax for making cordage. &c. America exports large quantities of the fibre to all parts of Europe, Mauritius being next in her supply. The plant in these countries is, moreover systematically cultivated, and the fibre being extracted by improved machinery, is commercially far superior to the Indian Aloe.—*Pioneer*, Sept. 9.

## PLANTING AT THE STRAITS.

In the "Negri Sembilan Government Gazette" of Sept. 3rd, received today, we find the Report by the Commissioner of Lands and Mines (Mr. H. Conway Belfield,) F.M.S., dated Taiping, 23rd March, 1897, and from it we make the following extracts:—

Seremban.—The progress of coffee planting by Europeans is very noticeable and satisfactory. Eight applications of this nature were registered during the year, and a total area of 4,138 acres was granted for this purpose. 6,977 acres were surveyed, and seven leases were registered for this purpose alone. The amount of quit-rent now paid annually in respect of large estates in the district owned by European planters is $2,707.56.

Port Dickson.—One thousand eight hundred and ninety-two acres of land were alienated during the year, bringing the total on 31st December up to 49,393 acres, distributed among the following descriptions of cultivation:—

| | |
|---|---|
| Gambier and pepper .. | 23,353 acres |
| Tapioca .. | 21,395 ,, |
| Coffee, kampong, and sawah.. | 4,645 ,, |

Ninety-one applications for land were received, embracing an area of 2,745 acres, and 195 leases were issued during the year. The concession of 11,000 acres of gambier and pepper land, granted in 1876 to Toh Eng Sew, for twenty years, fell in during the year, and the land reverted to Government.

Jelebu.—The total amount of land alienated in the State for agricultural purposes on 31st December was 2,740 acres, of which it is estimated that about 2,000 acres is padi land. Of this quantity, 552 acres were alienated in 1896. The mining lands now occupied amount to 6,514 acres, 411 acres having been given out in the past year, of the above area, nearly 6,000 acres are held by the two companies above mentioned.

## A CEYLON PLANTER REPORTING ON DOMINICA.

In the "*Colonies and India*" of August 28th we find the following reference to a Report presented to Mr. Philip Templer's Government by Mr. Naftel, so well-known here as a Pussellawa planter and afterwards *pro tem*, Visiting Agent to Messrs. Cumberbatch & Co.:—

We have received a copy of the report complied by Mr. C. O. Naftel, late Inspector of Plantations in Ceylon, who, it will be remembered, was invited

by the Government of Dominica to inquire into the capabilities of the latter island. Mr. Naftel is eminently qualified to perform such a task, having had more than 20 years' experience of tropical agriculture in Ceylon, and his report is a most valuable and interesting document which, although it applies particularly to Dominica, may be found to furnish some useful general hints to planters in other parts of the West Indies. Mr. Naftel holds up the Ceylon system of cultivation as an example to Dominica, and, in writing this report, he has had before him the hope that means may be found to enlist the services of Ceylon men for Dominica. The question has been asked why the Dominicans do not take advantage of the natural resources of their island. The principal answer is that they have no capital, and though the planters are experimenting in new products to take the place of their old staple, sugar, they cannot do much without money. What are required to bring out the resources of Dominica are capital, cheap money, and experience obtained in more prosperous fields of enterprise. There is no doubt that Dominica offers a profitable field for an agricultural company, and in addition to their being a good opening for such a company there is one for men with the necessary knowledge and capital. Planters trained in Ceylon have gone to the Straits Settlements, Borneo, and East Africa, to take up lands for Liberian or Arabian coffee. If others are meditating such a step Mr. Naftel advises them to look at Dominica first. There is no need to go so far afield and to bad climates, when, within a fortnight of England, there is this fertile island, possessing a climate difficult to equal, and certainly not to be surpassed by any place within the tropics. Mr. Naftel has seen enough of the island, and so compared its advantages with all that is considered essential for agricultural purposes in Ceylon, to induce him to confidently advise anyone with capital (which he can afford to invest without requiring an immediate return) and with knowledge of planting, or with confidence in some person whose services he can secure to plant for him, to invest in Dominica. It is to be hoped, therefore, that this report may bear fruit in the shape of attracting capital and fresh settlers to the island, the inhabitants of which, however, can greatly help to improve its condition by recognising and acting upon the recognition of the fact that what is worth doing at all is worth doing well, and that method counts for much, both in the eyes of capitalists and in the successful carrying out of even the smallest enterprise.

Not only coffee, but cacao and nutmegs are reported to do well in the West Indian island administered by the ex-Government Agent of the Central Province.

## TEA PLANTING IN FIJI.

We find the following advertisement in the *Fiji Times* of 7th August:—

For Sale.—The Wainunu Tea Estate, consisting of 700 acres. 200 acres under tea, fully bearing, will produce 80,000 lb. of tea incoming season. The latest appliances for manufacturing and water power for driving. Estate thoroughly clean and all buildings in first-class order. Inspection invited.—Apply to, Robbie and Evans, Levuka.

And an editorial note referring to it is as follows:—

The Wainunu tea estate, it will be noticed in this issue, is advertised for sale. The property consists of 700 acres, 200 acres of which are under tea and in full bearing, while it is estimated that the mill will produce 80,000 lb. of tea during the incoming season. The mill has all the latest and most improved appliances for manufacturing, being driven by water power. All the buildings are in first class order and the estate is thoroughly clean. The Wainunu tea is well known all over Fiji and finds a ready sale in the group, and as the demand here is nearly equal to the supply but very little has been exported, although what has been sent away has been reported on very favourably. Such an estate in Ceylon would be valued at from £80 to £100 per acre, for all the area under tea, so the planters in that island have evidently a high appreciation of tea property. The estate should prove a very profitable investment with any one with the necessary capital to carry on operations, not that the amount required would to our mind need to be very large.

We understand this Wainunu tea estate is the only one now in Fiji. If it were situated in Ceylon such a place would readily find a purchaser, but the scarcity and dearness of labour in Fiji will militate against it being sold for anything approaching a decent figure. Local sales of tea are the only thing to keep an estate going in Fiji, until labour conditions alter greatly for the better.

## TRINIDAD AND TOBAGO.

From the report of Sir H. Jerningham on the condition of Trinidad for the past year, it seems that the revenue was £618,332—the largest figure reached for years past—and the expenditure £594,462. The public debt is £556,288, wholly incurred for railways and roads. The population is estimated at 248,404, of which East Indians number 81,404. The imports amounted to £2,463,525 and the exports to £2,165,820, of which about half in each case belongs to British countries. Sugar and its products, cocoa, asphalte, and bitters are the chief exports. The area of the colony is estimated at 1,120,000 acres, of which more than half remains to the Crown. The area under sugar cane is 58,500 acres, and cocoa 97,000 acres.

The Tobago report is also satisfactory the revenue exceeding the expenditure. The labourers, who are mostly peasant proprietors, are in comparative comfort. The larger landowners and merchants may feel the pinch of the times, but the labourer, with his small holding and his few head of stock, supplemented by occasional work on estates or public roads, finds his existence an easy one.—London *Times*, Sept. 3.

## THE RESOURCES OF ABYSSINIA.

Ethiopia is a mountainous and very fertile country, the latter characteristic being especially true of the plateaus of moderate altitude (2,000 to 3,000 feet). According to the *Bulletin de la Société de Géographie Commerciale*, the products are barley, wheat, millet, maize, sorghum, flax, various oils, medicinal plants, potatoes, coffee, tobacco, sugar-cane, &c. There are vast forests; the sycamore, the mimosa, the tamarind, a variety of wild olive (reaching thirty feet in height), the lemon, the orange, and the coffee tree are among the principal species. The domestic animals are horses, donkeys, cattle, sheep and goats. Birds and bees abound. The latter contribute largely in certain districts to the wealth of the country, their honey being used in the preparation of hydromel, the favourite native drink, and the wax serving for candles. The mountains contain gold, copper, iron, and rock salt. Potter's clay is common, and in many places very pure. The principal articles of export are coffee, gold, ivory, skins, gums, wax and medicinal plants. The imports consists of cottons, silks, cloths, carpets, firearms, cutlery, hardware, provisions, and tools. The French colony at Obock has opened a route for commerce to Harrar and various provinces of the Empire. A postal service has been established between Djibouti, Harrar, Addis Ababa, &c., and there is telegraphic communication between the two latter places. In the interior,

the service is by horse; from Djibouti by boat. Addis Ababa, the capital, has a permanent population of some 50,000; the total number of inhabitants of the country is 15,000,000. Addis Ababa is an important centre of trade. Harrar is the residence of Ras Makonen; it has a population of 42,000. This is the point of transit of all the commerce from the southern provinces. The goods are brought to the city from the interior by mules, and carried thence to the ports by camels. The annual value of the trade of Harrar amounts to over £1,000,000, and is growing steadily. —*Journal of the Society of Arts*, Aug. 27th.

## AREKAS—PLANTAINS—PLUMBAGO.

### KEGALLA DISTRICT (CEYLON) AND ITS INDUSTRIES.

We have already reviewed Mr. Davidson's admirable Administration Report for 1896 on the Kegalla District; but it was so full of matter worthy of notice, that we could only give samples at the time. On next page will be found an extract supplying useful information bearing on the local industries in new and old products—in plantains (of which nearly 3,500 tons were carried from Rambukkana to Colombo last year!) as well as in arekanuts, Liberian coffee, cacao, and rhea. About arekanuts Mr. Davidson gives us new and valuable information accompanied by suggestions well worth the attention of the Government. He estimates the gross return from arekas properly planted at R90 an acre; and as the expense of upkeep and collection must be comparatively moderate, there would seem to be a margin quite as good as that in coconut palms. Mr. Davidson does not mention how long it takes to bring arekas into bearing; but from our own little guide for areka planters (out of type, but which we must at once reprint) we see the time required is five to six years only—a great advantage over coconuts. Curiously enough, Mr. Davidson's estimate of gross return (R90) agrees very closely with that of the late Mr. Borron (R87), although the latter, planting 10 by 10 ft. had far fewer trees to the acre. The natives, according to Mr. Davidson, would allow 1,200 arekas grow to the acre—far too many; but while he would cut this down to 750, Mr. Borron would have less than 500 arekanuts to the acre in order to do them full justice. The different views will be fully discussed in our little manual.

What we want to ask is why should every tea estate in the Kelani Valley not have its boundaries marked by areka palms? If there is room for a double or treble row (each tree 10 feet apart) so much the better. As a supplementary product to tea in the Kegalla district—the favourite home of the areka—there can be no better cultivation, unless it be pepper of which, however, Mr. Davidson says nothing, although it was the special staple of the district up to 100 years ago or so. The time has come when we [illegible] press on all lowcountry planters to give special attention to arecas, pepper and nutmegs.

In regard to plumbago in the Kegalla district, Mr. Davidson affords interesting information. The next time the Governor visits the valley, he should be taken over a selected areka palm grove; and down into a plumbago pit, if His Excellency would care to venture into the latter. We cannot help anticipating a considerable development of plumbago mining as certain to follow a Geological Survey. Mr. Davidson mentions one Kegalla pit which employs no fewer than 200 labourers!

## CINNAMON: THE LAST LONDON SALES.

The particulars which have reached us of the last quarterly Cinnamon Sales, held in London on the 30th Aug., give no cause for anxiety regarding the position and prospects of one of the principal ancient staples of the Island. There were 1,289 bales offered, as against only 779 bales at the corresponding sales last year; and of these 1,120 were disposed of in the auction rooms, at rather better prices than prevailed at the May sales. It may be remembered that in May only about one-half of the large offering of 1,676 bales found buyers at auction; and fears were expressed that already the trade was being overdone, and that the better prices which obtained, consequent on a steadier demand, were leading to a rush. We worked out some figures in our article on those sales, published in June last, in which we showed a very large progressive increase during the past four years. We at the same time published an extract from the "London Commercial Record" which contained some pointed remarks on the probable effect of swamping the market with inferior spice, and drawing attention to the absence from the auctions of two of the principal buyers. We ourselves have more than once commented on the facility with which such an article as Cinnamon might be overdone—as indeed its recent history, when over-production led to an almost ruinous fall in prices, shows—and warned producers, both against any great extension of cultivation, and the shipment of coarse and adulterated qualities; but the article in the "London Commercial Record" seemed to us more partisan than judicial, and to express the views of one section of the buyers which was rather irritated at the departure from the older practices of the trade. However that may be, the sales now under review prove that the supply is not yet in excess of the better demand for the spice which has sprung up within the last two or three years; for the competition for the lots was free, and led to an advance of 1d and even 2d in some marks. As usual Golua Pokuna heads the list, with its Firsts commanding 1s 7d, and one lot fetching as high as 1s 10d per lb., which quite recalls old days. Wester Seaton cinnamon realised up to 1s 4d, and J.D.S.R. 1s 3d; while the common kinds averaged about 11½d some marks fetching up to 1s. Nor was "unworked" spice neglected; so that altogether cinnamon proprietors are to be congratulated on the results of the last sales, and on the prospects before them. With all that, there is the danger of overproduction; and if all we have heard be true of large sales of seed for nurseries in the Southern Province, the next decade may witness an inevitable fall. Here is a statement of the exports to 14th September for four years:—

| | | Quills. | | Chips. |
|---|---|---|---|---|
| [illegible] | .. | [illegible] lb. | .. | 379,543 lb. |
| [illegible] | .. | [illegible] ,, | .. | 478,048 ,, |
| 1896 | .. | 1,346,298 ,, | .. | 551,898 ,, |
| 1897 | .. | 1,656,057 ,, | .. | 726,404 ,, |

It will be seen how large and steady has been the increase during the past four years.

PLANTING IN SEYCHELLES.—It might be inferred from our notes of yesterday that "800" feet was the present limit of planting in the island. Not so, coffee and even vanilla planters have gone up already to 1,6[illegible]0 or even 2,000 feet above sea-level. As much as 22*s* 6*d* net has been got for Seychelles Vanilla (ordinary,) in the early part of this year, and 30*s* for very fine samples.

## LAND IN NORTH BORNEO.

Mr. A. E. Wright who represesents some important Ceylon planters arrived here on the 15th August from Singapore and was the guest of Mr. H. Walker. He left for Lahad Datu on the 16th and on his return stayed at Government House until the 23rd, when he left with Mr. H. Walker for Kudat. He was looking for land suitable for coconuts, tea, coffee and cinchona and is reported to have been well pleased with some of the localities he visited.—*North Borneo*, Sept. 1.

## ARECA PALMS; PLANTAINS; PLUMBAGO, &c.

### AGRICULTURE AND MINING IN THE KEGALLA DISTRICT.

(*From Mr. W. E. Davidson's Administration Report for 1896.*)

What we ask from the

AGRICULTURAL SCHOOL

and the Royal Botanical Gardens is (1) that the Superinten dent and Director should guide us when we want information; (2) that we should be supplied with seeds and young plauts when we want them; and (3) that the Superintendent of the Agricultural School, or a really competent assistant from the school or from Henaratgoda or Peradeniya, should deliver special popular lectures on any new garden development. *E.g.*. this year we want iu Four Korales to have all the information we cau get on (1) the growing and preparing of rhea fibre; (2) the preparation of the tanning material in the green arecaunt, and an analysis of the increased profit to be derived from preparing the product locally. Again, this year and next in Three Korales I want the whole country to hear all the facts and figures about plantain culture, so as to have their produce properly cultivated and ready for the railwav to carry it to the market. If Mr. Drieberg can prepare popular lectures on these points with limelight illustrations and such-like attractions, I will guarantee to find twenty audiences in selected neighbourhoods, and the net advantage to the country will in one season exceed all the advantages derived from any attempt at local school training. In fine, from my point of view the one benefit derivable by this district from the appointment of an Agricultural School in Colombo is tbat the Superintendent, or a competent assistant, should deliver locally popular lectures on popular subjects. He should fulfil the same functions as are discharged by a "County Council" lecturer, *e.g.*, as in Sussex.

The subject is fully discussed iu my reports of the 2nd December, 1895, and of the 16th February, 1897.

NEW PRODUCTS.

In the same reports I have reviewed the history of the attempts to introduce new paddy, *e.g.*, muttusamba pulukhamban, and Carolina, and of barley; of new garden fruits such as pomegranate, Mandarin orange, Madagascar papaya, pomeloe, loquat, jambu, guava, and the Cochin goraka; and of new commercial products, such as tea, Liberian coffee, cacao, cotton, cloves, pepper, and rhea fibre. The growing of rhea fibre promises to develop into a cottage industry.

In a fertile, highly cultivated district like the Four Korales a great deal depends on facilitating the transport of surplus produce to the best market, aud in this direction my own efforts have been specially directed by opening out feeders to the railway and constructing bridges and developing paths into roads fit for wheeled transport. In this way the area upon which plantains can be profitably cultivated has been greatly extended.

Following up the detailed account of the *plantain* industry given in the 53rd paragraph of my report for 1895, I furnish in the next paragraph a few particulars of general interest regarding *arecanut* cultivation. I may record here that the plantain industry around Rambukkana is still growing fast, and that the railway carried 3,481 tons of plantaius from Rambukkana to Colombo, earuing thereby freight charges amounting to R19,319·55. This local industry will reach its culminating point about 1,900 and will then fall away owing to want of further suitable so I hope that the cultivation of rhea fibre—well-suited to village ideas—will step in to take its place.

The *Arecanut palm* flourishes throughout the Kegalla District most luxuriantly. Although it grows freely over a limited range in other districts and countries, yet, as almost the sole source of supply to Southern India of what the Indian races look upon as a necessary of life, the arecanut trade of the Kegalla District has for generations represented one of the few agricultural monopolies of the world. The produce of the arecanuts of Four Korales was the backbone of the King of Kandy's revenue; and the Dutch Government on the coast used, whenever occasion arose, to put pressure on the Kandyan King by blocking the export trade at Puttalam and Kalpitiya and stopping the importation of salt in exchange.

Arecanut palms, if left to seed as they please, grow as densely as 1,200 to the acre. This is often the density iu the village Aramba; and then the average yield per palm is 80 to 100 nuts. If, however, the palms are planted (as is generally the case now) at 750 per acre, they practically double their yield. A fair crop is 120,000 nuts per acre, and 24,000 dried arecanuts go to tbe amunam, which is the standard measure of the trade. The weight of an amunam of dried nuts is 2½ cwt. The yield therefore may be calculated at 12½ cwt per acre. An amunam of dried nuts sells on the spot at from R12 to R24 according to the market demand and the facilities of transport. The present average rate is R18; it seems to me probable that high prices will be again reached owing to a quantity of the crops being sold when unripe as sliced arecanuts in order to meet the demand of a new market. The gross average return per acre would be about R85 to R90. An experiment in which 250 palms only were planted in au acre resulted in an average yield of 750 nuts per palm, or 187,500 nuts per acre. This is equal to about 8 amunams per acre, or nearly a ton in weight, with a gross return of R144 per acre. The yield of the Madras Presidency estimated at 3,000 tons off 1,600 acres, is manifestly iuaccurate. The area under arecanuts in the Kegalla District is 24,749 acres, rather less than one-half of the total acreage under the arecanut in Ceylon. The yield is 15,469 tons in weight, and that of the whole Island at perhaps 25,000 tons, of which about one-fourth appears scheduled in the Customs returns as exported to India or Mauritius. It is probable, however, that the weight of the produce has decreased before export, and that the quantity exported considerably exceeds one-fourth.

The growth in the demand for "kalli pakku"—the sliced green arecanut—has been very marked in the past few years, and it is now most profitable to dispose of the crop while still green and unripe. It is used in South India, I am informed, to tan leather, chiefly sheep skins. But it is generally boiled down and made into a kind of "kaipu," and in its prepared state finds its way to Bombay and is shipped to Europe. It has been suggested to me that the Government should send a trained agricultural student to the coast of India to ascertain the processes through which the prepared produce passes, the prices current, the ports of destination, and the uses to which it is eventually put.

PLUMBAGO.—I here follow up the theme touched on in the 54th paragraph of my Administration Report for 1895. A professional miner, who has been appointed Inspector of Mines under the provisions of Ordinance No. 2 of 1896, has made a thorough inspection of the plumbago pits in this district and reports highly as to their prospects, which he considers equal to any in the Island Of the 18 pits now open and working, 10 are situated in Beligal korale, 4 iu Paranakuru korale, and 4 in Three Korales. In Beligal korale is the deepest perpendicular shaft in the Island, 328 feet deep; and at another pit there was on the day of his last inspection a force of 201 labourers, the largest force at any oue pit iu Ceylou. The average number of miners employed is a little short of 1,000 men The condition of the timbering is generally

excellent, and the cooly lines, where such are required, are fair; the checkrolls seem kept in a business-like way, and there are no complaints as to the non-payment of wages. The labour shifts—24 hours—are too long for efficiency one would think, yet the arrangement is popular with the men, who like to have a day on and a day off. Nearly all the pits are sunk by perpendicular shafts, which are the most economical to work and the safest to work in. Two fatal accidents were reported during the year: one from the falling in of earth in the only pit which consists of an open cutting, and one in hammering a blast.

The output for 1896 is estimated at 1,516 tons, worth at the pit's mouth R196,305. The following are the figures, which are based on imperfect information, for the last four years:—

| | | Tons. | | Value. |
|---|---|---|---|---|
| 1893 | .. | 3,520 | .. | R. 422,400 |
| 1894 | .. | 1,875 | .. | 163,220 |
| 1895 | .. | 2,254 | .. | 225.400 |
| 1896 | .. | 1,516 | .. | 196,305 |

## MINOR PRODUCTS TRADE REPORT.

Sept. 2.

Cardamoms.—The supply was again moderate and with an active demand; the whole sold, on the average, at an advance of about 2d per lb.: good bold pale Ceylon-Mysore realised 3s 10d per lb.; medium ditto, 3s 4d per lb.; small ditto, 3s per lb.; medium splitting, 2s 9d to 2s 11d per lb; brown splits, 2s 7d per lb. Seed sold well at 3s 1d per lb; for good, down to 2s 9d to 2s 10d for pale. The arrivals last month were 160 cases, deliveries 303, and stock 862 cases, as against 426 same time last year.

Cinchonine.—Howards' sulphate has been raised to 4½d per oz. in bulk vials 5½d for not less than 25 oz.

Coca-leaves.—At auction 20 bales of Truxillo and Bolivan were offered and bought in at 6d per lb. The following figures relate to the Java export of coca-leaves for the last four years from July 1st to June 30th:—Bales 1896-7, 1,067; 1895-6, 1,105; 1894-5, 1,121; 1893-4 362.

Croton-seed.—Seventeen bags were shown today at auction; 10 of these, poor and dark mixed, were bought in, there being no bid at 30s. Of another lot of 7 bags, 4 sold at 50s per cwt, subject to approval the remaining 3 being bought in nominally at 80s per cwt.

Oils (Essential).—There in a fair amount of business doing in essential oils this week, but there are no changes in price to report. Cassia is without alteration; business has been done at 5s 1½d per lb, c.i.f. terms, for 80 to 85 per cent. Oil of cubebs is offering at 4s 3d per lb., 8 cases of Cinnamon oil were bought in at auction at 5d per lb. About 100 cases of Eucalyptus oil were offered today, but nothing was sold. For 17 cases, commercial quality, a bid of 10d is to be submitted; 16 cases from the Macedon Eucalyptus Oil Distillery Company. Macedon, Victoria, were bought in at 2s 1d per lb. Other lots were bought in at 1s per lb for fair commercial quality. Nutmeg oil: Seventeen cases were offered, but nothing sold; from 2¾d to 3½d per oz. is asked.

Quinine.—9½d per oz. still remains the nominal quotation, though we hear that business has been refused at this figure for a speculative order of 10,000 oz. Wholesale druggists' orders are being filled on the spot at 9¼d per oz. At acution today 1,000 oz. of Tallandier's brand, in 100-oz tins, were offered at 9¼d per oz, without finding a buyer. The arrivals last month were 2,686 lb, with deliveries 4,082 lb, and stock on August 31st, of 85,566 lb, as against 99,098 lb same time last year.

Vanilla.—At auction, 153 packages were offered. Of these 120 sold, common foxy, 3½ to 8 inches, 11s to 21s 6d; bad-keeping 6½d to 8½ inches, 23s 6d to 26s; fair dull to good chocolate, 3½ to 8 inches, 21s 6d to 26s; fine fresh chocolate, 6 to 8 inches, 26s to 27s 6d. —*Chemist and Druggist*, Sept. 4.

## CEYLON TEA COMPANIES:—DIVIDENDS AND "RESERVES."

We happened to be in Scotland when the City of Glasgow Bank came down, and witnessed a scene of unexampled financial excitement and disturbance. We recall, too, the deliberate opinion of a shrewd old private capitalist who had prolonged experience as an investor and who was a great authority on share-lists. "Of all home investments"—he said—"my favorites are Railway shares. Railway Companies furnish their reports and accounts in such a way that each shareholder cannot fail to understand exactly his position at the end of the twelve months, and he gets such dividend as the earnings justify, no more and no less. There is never any question of keeping bad debts out of sight, any more than of laying by nest-eggs for the future."

We are reminded of this praise of the accounts of British Railway Companies as, in their system of financing, models for all Limited Companies to follow, by the criticism in which our evening contemporary has once more chosen to indulge against the Directors of local Tea Plantation Companies, Limited. This criticism strangely enough is directed against local Directors for following the example which was held up to us well-nigh twenty years ago by a shrewd financier as the very best model that could be followed. But whether this be the best model or not, any one who has thought on the subject must realize that there is a great difference between the case of shareholders resident and at work in Ceylon—as most of the holders of rupee shares are,—and the average of shareholders in home sterling Companies. Here, shareholders almost to a man do not want their money to lie in reserve; they prefer to get a full share of what is earned, in order to utilise and, if possible, turn over such profit on their own account; and we cannot therefore see any fault to be found with local Directors for doing as their shareholders desire. The latter know exactly how they stand and if they are wise, they take steps against the evil day of lower dividends—fully anticipated for some years in the face of the steady fall in the price of tea—by further investments on their own account. But we are not trusting in this matter to our own inferences and authority: here is the opinion of a leading Colombo merchant who has had as much to do with successful Tea Plantation Companies as any man in the place:—

"With regard to forming Reserve funds for the *equalization of dividends*, I look upon 'H.H.C.'s' effusions in the local "Times" as all 'Tommy Rot' so far as Ceylon Companies are concerned. At home, where many of the shareholders may be persons totally unacquainted with the working of tea properties and perhaps looking for a steady income from their investments, Directors are no doubt wise in exercising a maternal care for the interests of their clients. You will not find that, in such concerns as Railways, which the British Public understand, this practice obtains. Shareholders in these Companies, I think, get as large dividends as can well be divided and consequently suffer or gain according to the returns of the year, and the value of shares fluctuates correspondingly. The origin of local Tea Companies was to enable people with a little spare cash and with faith in the future of tea, to take a limited interest in such ventures. A very large majority of the shareholders in local Companies

know quite well what they are about, and are not so idiotic as to expect the same return from their investments when the tea average is 7d and exchange 1s 4d, as with tea at 9d and exchange 1s 1d. The value of shares necessarily fluctuates with the price of tea, and a Reserve Fund to equalise dividends would not prevent this. Annual balance sheets are carefully examined and reserves are taken into consideration by purchasers of shares, but as soon as it becomes necessary to use such reserves for paying dividends, shares will fall in value. I am strongly of opinion that profits should not be reserved for future dividends, but that shareholders should have the choice of doing what they please with the annual earnings. Many may wish to 'average' their investments by putting the money into coconuts, hotels, &c., or into sterling concerns, instead of having it invested for them in a Bank at a nominal rate of interest. At the same time, unless a Company is *fully* capitalized, I am no advocate for dividing profits 'up to the hilt.' Almost every property acquired is in need of development, and if the subscribed or paid-up capital does not provide for the cost of such development, as well as for outlay on coast advances, &c., then by all means let the Directors reserve part of the profits to cover such excess expenditure. It may even be advisable in some instances (alas, that it should be so!) to have a cash reserve to carry on with, when the price of tea is so low as not to cover cost of production."

## PURSLANE, A "BOTANICAL WONDER."

The common purslane (*Portulaca oleracea*) is one of the wonders of botany, as far as seeds are concerned at least. A single seed of this plant will produce about 20 seed-pods in a season. The average number of seeds in each of these, by actual count, is 6,000, makiug 120,000 in all. As far as we have been able to learn, there is no instance of similar fruitfulness in any plant found growing in this country. A single plant of either the Jamestown weed (" jimson "), the butter weed, the rag weed, and some of the vervains produce an enormous number of seeds; but it is doubtful if any one of them produces onefourth as many in a year as the purslane does.

## COFFEE-PLANTING, LAND AND AGRICULTURE IN SELANGOR.

*(From Mr. Rodgers' Annual Report.)*

EUROPEAN ESTATES.—The chief cultivation was that of Liberian coffee, both by Europeans and Asiatics, and the cultivation of this product was extended in every district of the State. The number of plantations owned by Europeans now amounts to seventy-two, comprising approximately an area of 47,000 acres, of which 10,835 have been cleared and cultivated. The labour force employed consisted of about 4,000 men, chiefly Tamils and Javanese. I am glad to be able to record that several Ceylon planters, among whom was the Hon. T. N. Christie, the planters' representative in the Council, Ceylon, took up land in Selangor during the past year. The whole of the land selected by these gentlemen was in the Klang district, but some of it was situated at Damansara, a place 16 miles inland from the coast

NATIVE HOLDINGS.—The area held by natives approximately amounts to 60,000 acres. The cultivation of coffee has largely increased, but that of rice, and other products of tropical agriculture, has made comparatively little progress, and still leaves much to be desired. Regulations are now being considered for ensuring the simultaneous planting of rice, so as to minimise the damage caused to the crops by wild pigs, rats, etc., and the whole question of the best means to encourage and assist native planters is one of which should be taken into consideration at the first general conference of Federal representatives.

COFFEE CURING.—There is a small coffee-curing establishment at Klang, now owned by a Chinaman, which is of great use to native planters in the neighbourhood, but it is to be hoped that some firm of European merchants will soon see their way to establish a factory on a large scale, either in the Colony or Federated States, to which European coffee planters will send their produce to be treated, as is the practice in Ceylon. The export of coffee increased from 5,395 cwt. in 1895 to 8,388 cwt. in 1896.

PLANTERS' ASSOCIATION.—The Selangor Planters' Association has given valuable assistance to the Government, and its Chairman, Mr. E. V. Carey, was selected to represent the State on the Labour Commission. The various local associations have now been amalgamated, and a central association has been formed, representating the planting interests of all the Malay States.

## NEW PRODUCTS IN THE KELANI VALLEY (CEYLON).

With reference to our remarks on another page, we are able to quote the views of a proprietor as follows:—

"(1) Arecas don't pay. I think that where they are grown on tea estates (and there are several estates which have them) the coolies are allowed to gather the nuts for themselves.

"(2) Pepper and nutmegs are troublesome subjects and Superintendents with the careful attention they have, or ought, to give to tea have not the time to devote to their successful cultivation. I do not think that these minor products can be made to pay (in Ceylon) the value of European supervision!"

This simply means that tea, even now, is too profitable to make it worth while to attend to minor products. Should misfortune overtake tea, the case will be very different! After coffee failed in Ceylon, business in vegetables and milk and butter even was not despised by upcountry planters. It would be well, therefore, to keep planting arecas and nutmegs in the Kelani Valley against the chance of an evil day to come. The coolies can soon be taught not to steal when they see the durai in earnest about his crop; while as regards the trouble involving in growing and cropping the pepper-vine and preparing the product, all this is as nothing to the trouble taken over tea—at one time thought to be far beyond the Ceylon planter and his coolies. Surely one or two coolies, well up in "pepper," could be got down from that part of Southern India, which supplies for export some 222,383 lb. of pepper every year; while the export from Ceylon once considerable has dwindled to a mere trifle.

## BRITISH NORTH BORNEO.

(Wednesday, September 1.)

RHEA cultivation has, we may note, justbeen commenced in the Suan Lambah district. Several thousand plants have been put in. People desirous of seeing the beautiful fibre it produces with specimens of cloth, canvas and belting manufactured from it, can do so at the B.N. Borneo Museum.

WE hear that Mr. Hastings has had some good plants of tobacco raised on the Areudsberg Company's ground near Tawao, in view of that Company's early opening of an estate there. The tobacco is reported to have grown well and to be very fine. The Company will commence work in September. A commencement has also been with made the necessary buildings.

## PLANTING NOTES.

Tropical Fruits.—It is surprising we do not see more tropical fruits in the markets. What would attract more attention at large dinner-parties during Christmas-time than a dish of Custard Apples or Avocado Pears? They would add the variety and change so much needed, the flavour is so nulike that of our own native fruits. The two fruits mentioned I can recommend as being very palatable. The Melon-Pear, frequently seen two or three years since, has not gained favour in this country. The Loquat (Eriobotrya japonica) I am not acquainted with. I had a large plant, but was not successful in fruiting it, I should be interested to know if it has produced edible fruits in this country [often]. W. H. Clarke, Wellington, Somerset.—*Gardeners' Chronicle*, Sept. 4.

Local Tea Companies and Reserve Funds.—In his rejoinder to recent criticism our evening contemporary takes special care to ignore the all-important reason given by a mercantile authority and ourselves for the course pursued by the Directors of Rupee Tea Companies with the full approval of their shareholders. The latter being nearly all in the Colony and busy on their own account, did not—and do not—want their money locked up in a reserve, lying idle at the bank; but preferred to get a full share of their Companies' earnings, in order to invest on their own account. For our contemporary to pose as superior in sagacity and business aptitude to the mass of the Directors and shareholders in local Companies, is rather ridiculous!

Vanilla Cultivation in Seychelles.—Government House, Seychelles, Sep. 25th, 1896. Sir,—I have the honour to report that the result of the Vanilla crop for this year is most satisfactory. The crop up to the present (it is not quite gathered) is returned at 40,000 lb., and has realised over half a million. The prices have been exceptionally high owing, I am told, to a reduced exportation of Vanilia from Mexico. Seychelles Vanilla is now well and favourably known both in London and Paris markets.—I have, &c., (Signed) H. Cockburn Stewart, Administrator. To the Right Hon. Joseph Chamberlain, M.P., &c. &c. Extract from Colonial Reports, Annual. No. 182. Seychelles. Annual Report for 1895, p. 9. Next to coconut oil Vanilla is our most important produce, and in a good year the crop gives a return of about R400,000. Unfortunately vanilla is a most capricious plant, and, whereas we may have a good crop for two consecutive years, we may have also three, or even four, years without any crop at all.—*Kew Bulletin.* [One planter gets as much as 30s or 32s 6d per lb. for his Vanilla. For 1897, we believe, the crop will not exceed 25,000 lb.—Ed. *T.A.*]

Longevity of Seeds.—Botanists, who have reason to revere the name of de Candolle, will read the following note with sympathy, not only for its incrinsic interest, but also as the production of one of the fourth generation of this famous botanical family. M. Auguste de Candolle, who now writes to us, is the great grandson of Auguste Pyramus de Candolle, who died in 1841. With reference to M. Ch. Naudin's paper on the longevity of seeds and their preservation in the earth, referred to in a recent number of the *Gardeners' Chronicle*, the following facts may be of interest. Some time ago, I was put in possession of some earth which had been dug up in Peru, n ar the Amazon River. Less than four days after the earth had been plac d in two large germinating pans in a hothouse, a species of grass began to spring up, which proved to be Eleusine indica, Stead., and of which I subsequently counted over a hundred plants. I also detected Vandellia crustacea, Benth., a Spurge, and a species of Verbenaceæ, perhaps new. These species all flowered and produced seed in due course. No doubt, with proper care, and had the Eleusine been kept down, many more distinct species might have been reared. *Aug. de Candolle, Geneva.*"—*Gardeners' Chronicle*, Sept. 4.

New Garden Plants at Kew in 1896.—Kendrickia Walkeri, Thw. (*G.C.* 1896, xx., 394.) Melastomaceæ. S. Described as one of the most beautiful of Ceylon plants. It is a climber with creeping ivy-like stems, ovate fleshy grey-green leaves and terminal umbels in large bright red flowers. Ceylon. (Kew.)—*Kew Bulletin.*

The Manufacture of Picric Acid.—On Saturday, at the Dartford Petty Sessions, Mr. Bruce, on behalf of Messrs. Wallace & Co., manufacturing chemists, of Fenchurch Street, London, E.C., gave notice of an intended application for permission to make picric acid at their works at Crayford. Mr. Bruce stated that the acid is largely used in the manufacture of explosive, and at present is only made in Germany. The Bench fixed October 9th for hearing the application.—*Chemist and Druggist*, Sept. 4.

The Forests of India.—Few people have any idea of the immense forest area in British India—a valuable asset which is now being systematically conserved. At the present time the reserves of forest cover an area of nearly 75,000 square miles, and they may hereafter be further extended in Madras and Burma, where the work of reservation is as yet incomplete. Outside these reserves are about 56,000 square miles of State forests some part of which will be brought eventually within the reserve area. This means that there are in India, practically for all time, forests which would completely cover the United Kingdom.—*Daily Chronicle*

Cruelty, Coffee and Rubber in the Congo Free State.—The following in *The Century* for September is from the journal of the late E. J. Glave who crossed Africa in 1895:—

There is good ground for coffee at Stanley Falls, where it grows prolifically. The station is on the north bank, just below the rapids and falls. In former times the station was on the south bank, but the tendency with the Arabs has been to the other side of the river. All ivory and rubber comes to the station of the Congo Free State. No matter how wide a road you make, the natives soon have in it a tiny footh-path, and tramp one after another in single file.

The state conducts its pacification of the country after the fashion of the Arabs, so the natives are not gainers at all. The Arabs in the employ of the state are compelled to bring in ivory and rubber, and are permitted to employ any measures considered necessary to obtain this result.

Mr. Glave died just at the conclusion of his expedition, May 12, 1895, at Matadi, near the mouth of the Congo. Shortly after his arrival at Matadi, he wrote a letter to the President of the Century Co., dated April 25, 1895, in part as follows:—The administration of the Belgians is decidedly progressive. Five large, comfortable boats have replaced the tiny A.I.A. "Royale" and "En Avant" on the upper river: a reliable postal service has been established to the very limits of the state territories; the Arab slavers have been crushed beyond ever again being a menace to the state's authority; and the Congo Railway, already running over a well-laid track for sixty miles, promises completion in three years' time, provided sufficient funds are founds. This line will of course supersede the miserable depopulating system of manual transport by the native porters (the Bakongo), and will, when finished between Matadi and Stanley pool, bring the heart of Africa within easy reach of the markets of the world by steam communication. The state intends also to carry a telegraph line from the coast to Tanganyika, and operations are already begun. Coffee of a superior quality has been found to grow out here in nearly every district, with most promising results; and, to my mind, coffee and rubber will constitute the main articles of profitable export. Ivory is getting constantly scarcer, and in a few years' time trade in elephant-tusks will have yielded up its important position in the list of African products.

## "HOW TO ECONOMISE THE AVAILABLE LABOUR SUPPLY ON OUR TEA PLANTATIONS."

### REVIEW OF LETTERS XVIII. TO XXVI.

The nine letters now under review cover a very varied range of districts. "W.J." from the lowcountry, who has also had long experience upcountry, is followed by "G. D. D." from a high district, and by "S." from a mid-district. The first has had no practical experience of shoots, and as he left the hill-country before the era of tea, he excuses himself from offering any opinion on shoots, tramways, and other labour-saving appliances. "G. D .D.," though also without personal experience of shoots, has seen them at work, and though they are said to damage tea leaf, he cannot understand how that can possibly equal the compensating advantages. For firewood they are undoubtedly useful; but tramways would be difficult to work on steep places and too expensive on most estates. Telephones, tavalams, wire tramways, cart roads, and carts in the lowcountry, are the labour-saving appliances which must be requisitioned according to special circumstances. "S." knows that shoots work satisfactorily, and think, they should be used more largely; but he counsels less costly or more lasting "runners" than those now in use, which are a great source of expense. "B. W." from the lowcountry, while asserting the undoubted usefulness of shoots for down-hill loads, expresses his preference for wire tramways for leaf, as they save crushing and damage, and can further work up-hill. He has experience of a 2 ft. tramway on the estate from which he writes, and finds that it saves a lot of labour, as a car fully laden with 4,000 lb. of leaf can be moved by four coolies. "Engineer," with experience of erection, supports the previous writer, as regards both shoots and wire tramways, and thinks they can be much more largely used than they are, as they effect an immense saving of labour; and the former need not damage tea leaf, if stretched at an easy gradient. His opinion coincides with that of most planters, as to the inability of the average estate to afford a tramway; but he believes that water-power might be far more largely used than it is—many estates using a steam engine all the year round, which might well utilise water 8 to 10 months in the year at a great saving of cost. "K. V."'s incredulity as to the fitness of shoots for the economical transport of leaf should cease in presence of the body of evidence in their favour; but he believes in them for fuel, though not in tramways on the ground of cost. "Lunugalla" has had no experience of labour-saving appliances for transport, but thinks trams should be useful where manuring is done to any extent. This opinion is not shared by "G. J. R." from a high, and "W. M. U." from a low district, both of whom are in favour of shoots and aerial tram ways; while the latter favours narrow hand-carts as a means of saving the coolies the carrying of tea chests, which is work they detest.

"W. J." is in advance of many, perhaps most, of his brother-planters in believing that weeding is being overdone. His difficulty lay in finding a weed which would protect the ground and save wash without being injurious to tea and coffee. The entrance of grasses would have to be guarded against: mosses would not grow below 4,000 feet—is he sure of this?—and even if an imported plant of very *low* growth be found he questions whether there can be any real saving of labour. He is also entirely against any digging in of crops grown for that purpose, as the loss of soil would more than counteract any benefit from aeration on even moderately steep land. He is supported in this view by "G.D.D." and also by "S.," both of whom favour clean weeding; and the latter has special experience of a moss-grown patch on his estate, which at once responds, now in tea, as it did when it was under coffee, as soon as light and air are admitted to the roots by the use of the "karandy" on the moss. We can quite understand this result, especially in damp situations where the soil shows a tendency to sourness; while, perhaps, in soil without such tendency moss will not thrive. And this view finds favour with "K.V.," who, while holding that moss does not seem to do harm, has found that it will not grow on some spots. On the other hand, he does not think weeding overdone; but he desiderates, what would be priceless, a plant which, while thickly covering the ground, would take little or nothing out of it! Considering the general poverty of our soils and looking to the importance of preventing wash, he would neither grow a second crop nor dig it in. "W.M.U." shares this view, while holding that weeding as practised now is underdone, rather than overdone. He would clean the land thoroughly to begin with, and thereafter never allow weeds to grow to the extent that would cause disturbance of soil for their removal. Mosses he would not disturb, as they go off when heat and drought supervene. "Lungalla," too, favours mosses, and objects to mamoty weeding, and so does "G.J.R." who pronounces, from long experience, that weeding cannot be overdone, and considers selected weeding next to impossible. "B.W.", however, always encourages mosses, &c., as soil binders and thinks cutting down weeds the correct and scientific way of treating them and the soil.

On Drainage all our correspondents are pretty well agreed—that the drains should not be too far apart, nor the gradient too steep. Few have yet made the acquaintance of euscus; but those who have tried it, like it. Terracing is considered the ideal provision against wash, but the cost is prohibitory over any considerable acreage. Hand-carts as auxiliaries to transport are recommended by more than one Planter, because they would obviate unpleasant work for coolies who, in the opinion of two very experienced and observant Colonists, should be encouraged to make the existing labour supply go as far as possible by santosums to men who work 24 days at least in the month. The idea is an excellent one; but the gift should go direct to the worker, so that he might feel himself independent, to its value at least, of the Kangany who generally appropriates all he can of monthly balances for debts, real or fictitious.* The

* If it were possible to get Ramasamy to bank such surplus cash either at the Post Office or with his employer, a great advantage in starting him on a course of thrift would result; but we fear the time has not yet come for a move of that kind, however desirable.

influence of vegetable gardens to bind the cooly to the estate is very freely admitted ; but any interference with his liberty to roam to whatever boutiques he pleases for supposed bargains in curry stuffs, is depreciated ; and there is much in the suggestion that estate caddies are often the home of illicit trade in arrack and the destination of stolen estate produce. Ramasamy's weakness for a drop too much when he has a chance is a sad, but not unique, feature in his character, but far better a licensed tavern than contraband trade.

*(Letters Continued.)*

### No. XXVII.—High District.

(1) Have used wire shoots for manure, firewood grass, &c., but not for transporting tea leaf; they, save a deal of labor.

(2) ———

(3) Have had no experience.

(4) It has often struck me that weeding was overdone, but, as a rule, our hilly land would suffer from any other kind of weeding.

(5) Selected weeding might be tried with advantage, but less frequent weeding would be a mistake.

(6) Have not experimented in this way.

(7) The present system of drainage is not satisfactory, but I doubt if it can be improved on at a cost that would pay.

(8) ———

(9) Good gardens make coolies more contented, as a rule.

(10) This might be advisable on outlying estates.

(11) Liquor shops to sell by the glass might be done away with altogether, with advantage.

C. A.

### No. XXVIII.

(1.) No experience.

(2.) I have not seen anything beyond what is usual in all well-equipped factories and estates.

(3.) Very doubtful, except in very exceptional places.

(4.) Weeds are pernicious wherever met.

(5.) One argument in favour of clean weeding. is the saving of labour ; coolies are generally more content on a clean estate.

(6.) No.

(7.) A good deal more might be done in draining, both by having drains closer, and a system of silt traps; tea apparently feels

(8.) Wash more than coffee.

(9.) A present of a Spinning and Weaving Co.'s cloth every 6 months to all good pluckers, and once a year to everybody on the estate.

(10) Private Bazaars are good and they help to control illicit arrack dealing.

(11.) It is not so much the liquor shops as the enormous amount of illicit dealing that we have to content with.

(Signed) DIMBULDANDAOYA.

### No. XXIX.—Medium District.

(1.) Wire shoots can be used with advantage for shooting down tea leaf or firewood to the factory on estates where the land is steep.

(2.) I consider a tea-packer to be a considerable saving of labour in the factory.

(3.) Have had no experience of tramways, but should doubt if they would pay on most estates with labour at present rates.

(4.) (5.) I think selected instead of thoroughly clean weeding might be a good thing, but doubt if one could get coolies to carry it out properly.

(6.) Have never tried the experiment and can give no opinion on it.

(7.) Yes, if carefully and thoroughly done. In steep stony land I have put terraces at an almost dead level right across the hill-side instead of drains and found the system answer well.

(8.) ———

(9.) I think it is a good thing to let coolies have gardens round their lines, but it is worse than useless trying to be *generous* to them. Give them good and sufficient line accommodation and treat them *justly*—but try and attempt nothing further.

10.) It is a good thing, I think to prevent coolies going into the towns for rice, &c.

(11.) Yes, the liquor shops are a great source of trouble, but it is hard to know what to suggest except possibly that every liquor shop should be licensed directly from Government and the present system of arrack renting done away with.

E. W.

### No. XXX.—Lowcountry.

(1) Yes. Not if properly erected.

(2) ———

(3) No I do not think so. I believe that with rather broader roads cut, leaf carts drawn by bullocks is the cheapest method for transport of leaf to the factory.

(4) No. But too much "scraping" is done.

(5) I think shade trees such as Albizzia stop a good deal of wash.

(6) ———

(7) ———

(8) A really good machine for tea-plucking.

(9) Gardens. Cows and goats.

(10) Most of the kanganies and many of the coolies have been on this estate for twelve years, and seem as a rule contented.

(11) There are several arrack shops, but we have very little trouble from them. The illicit selling of toddy etc. by the villagers does more harm.

LOWCOUNTRY.

### No. XXXI.—High District.

(1) I believe in wire shoots and think on many estates they could be used and save a deal of labour; if properly erected they do no harm to leaf.

(2) Saws (circular) for cutting firewood could more extensively be used.

(3) No, I do not think so.

(4) No.

(5) No.

(6) No, I should not advise such an experiment.

(7) Drains are generally cut at too steep a gradient which causes loss of soil. But if cut at say 1 ft. in 25 to 30 feet I find they stop wash well and the soil except in very heavy rain is not wasted.

(8) In getting larger averages of leaf per cooly; but as the labour in Ceylon now is so utterly demoralized, I fancy this cannot be done.

(9) I do not think they want any.

(10) No.

(11) Very much so and if there were ½ the amount of liquor shops, our coolies would be certainly better I believe.

In reference to my answer to No. 8, coolies now do at most ½ the work they did (per day) 18 years ago and the average per cooly in plucking leaf is very much less in the last 8 years, in my idea and my experience extends over 20 years of planting life. I am of opinion, that our coolies now, are half useless—and what is the cause of this? Years ago one never heard of a cooly taking his master to Court. Now the exception is the other way. If you gain your case in the Police Court, it's one thousand to one, you get it upset in appeal, and the cooly soon believes this, and simply does as he likes.

G.

### No. XXXII.—Mid-District.

(1) Yes, my experience proves they might be *far more* largely adopted, but runners could be improved. Leaf is not materially injured.

(2) Many roads on easy gradients could be widened into tracks for single bullock carts.

(3) Only on large properties or groups of estates where roads had been laid out suitably.

(4) Clean weeding is cheapest and therefore best from every point of view.

(5) No.

(6) No, not in tea. Except when lay of land is unusually easy.

(7) Hedges of tea above roads and drains are tried now in parts of Dimbula. Cuscus suffers from a fungus at roots very often, also from scale and black bug and is not desirable.

(8) Machine pruners and pluckers. A light, cheap, narrow transport cart à la bicycle. *Better tempered steel tools!*

(9) Unquestionably, give gardens to all coolies who will use them and keep them clean; encourage growing vegetables largely.

(10) It would be a *good* thing for estates to have their own bazaars and canteens, but whether practicable is another question.

(11) Yes, liquorshops are a nuisance, but no use to abolish them. Their number might be reduced with advantage. Gothenberg System should be tried.

(Signed) T. KOKO.

## No. XXXIII.—High District.

(1) Yes. No, not more than leaf carried in sacks.
(2) ———
(3) On large estates only.
(4) Yes.
(5) Moss very bad for tea bushes.
(6) No.
(7) Fairly so. Only by terracing.
(8) ———
(9) Treating them justly and getting a good day's work from them. Gardens generally given.
(10) No. The nearer the bazaar, the bigger the debt.
(11) No. S.

## No. XXXIV.—High District.

(1) Have had experience of wire shoots. They might be more freely used; but by any method I have seen of working they damage leaf.

(2) More cart-roads wanted. Less might be spent on useless tanks and a little more on cart-roads.

(3) Not only tramways, but a modification of switchbacks could be used on estates and elsewhere.

(4) Weeding is overdone especially on steep land and wind-blown ridges. The soil, if bare, cannot fail to suffer during the monsoon.

(5) I would advise selected weeding; especially on steep land and exposed ridges.

(6) Have no experience.

(7) I consider the present system as satisfactory as practicable; but if a grass could be got that did not spread, much benefit would result from planting as suggested.

(8) All estates of 100 acres or over, ought to be assisted to afford cart communication to the station at least from the boundary.

(9) I think, coolies are generally very liberally provided with gardens so far as the estate is concerned. The cultivation and turning them to account is in their own hands.

(10) Wherever there are coolies, boutiques or bazaars very soon follow.

(11) Liquor shops are a curse to the coolies and a perfect nuisance to all concerned. M.

## No. XXXV.—Medium District.

(1) Wire shoots are very useful on steep estates for firewood, less so for leaf. Are already in general use where suitable. Do some damage to leaf if the shock at the base be too great. Runners are a great trouble and expense.

(2) Wire tramways worked by power are being successfully worked and may often be much more economical than a cart road.

(3) Transport of leaf by coolies does not take up much labour and 18″ or 12″ tramways would be of little use for this. For transporting tea, rice, &c., a wire tramway or cart road would be better. Few estates would suit tramways.

(4) This was discussed in the papers about 1882-3 by "Ageratum" (G. D. Collinson) and others and has often been thought of since.

(5) Regular clean weeding is the cheapest and therefore most labour-saving method. No doubt soil would be preserved by letting weeds grow and "selected weeding" if it could be done would be good husbandry. Cleaning up after weeds have got in is very expensive.

(6) Have not tried, but think other forms of cultivation would pay better.

(7) Silt pits in the drains, about 4 ft. long by 1 ft. deep and the width of the drain have worked very satisfactorily. They must be kept cleared and should be at frequent intervals say 10 or 12 ft. apart.

(8) Labour would be saved if the migration of gangs could be diminished. The coolies in these migrating gangs won't work, but live on what the kangany can screw out of successive Superintendents.

(9) Certainly gardens are of great importance and when cultivated generally imply that the cooly intends to stay. Good lines, good water, and dispensaries on the estate or within easy reach, should be provided.

(10) If rice is issued on the estate, boutiques would be useful, otherwise coolies will go to the bazaar and exchange their rice for their other wants. More might certainly be done for the coolies, but they don't always know what is good for them.

(11) If you abolish the arrack tavern you encourage the illicit dealer who sells adulterated arrack, also the cheap gin shop. Few estates but have their regular supply of arrack on sale in the lines.

O. Y. A.

## REVIEW OF LETTERS XXVII. TO XXXV.

The nine letters under review do not cover as much space, as the batches we had previously reviewed; but they are none the less suggestive on that account, nor are the opinions they contain less weighty or definite. While "Dimbuldanda Oya" has had no experience of wire shoots, and regards tramways a very doubtful ally, except in very exceptional places, "C. A." from a High District has used shoots for manure, firewood, grass, &c., and found them a great saving of labour. "E. W." from a Medium District commends shoots for leaf, as well firewood; but like "C. A." he has had no experience of tramways, and doubts whether they can be shown to pay on most estates. "Lowcountry," "G." from High District, and "T. Koko" from Mid District, endorse this commendation of shoots, express their belief in the saving of labour they would effect in many estates on which they have not yet been erected, and see no reason why leaf should be damaged, if the shoots are properly erected and carefully worked. All three correspondents are further agreed that tramways are unsuited to the average estate, and two of them prefer wider roads and light single-bullock carts as means of transport. The suggestions that circular saws for cutting firewood and packers for packing tea, should be more largely employed as labour-saving appliances are deserving of attention. "S." from High District, as also "M.," and "O. Y. A." from Medium District agree on the advantages of shoots; but, while "S." declares that leaf is not damaged by their use to a greater extent than leaf carried in sacks, "M." has found leaf damaged by every method tried. "O. Y. A." on the other hand, refers damage to too great a shock at the base—a drawback, surely, which can be avoided; while he has found runners a great trouble and expense. His experience of wire tramways is greatly in their favour, and they may often be much more economical than cart roads; while both are to be preferred to ground tramways which would not answer on most estates. "M."

is more venturesome than most of his contemporaries; for he goes beyond tramways, and suggests a modification of switchbacks, though he does not disdain cart roads, and thinks more might be spent on them than on useless tanks.

As in previous letters, so in those now before us, there is much diversity of opinion on Weeding. "C. A." has often thought weeding overdone; but as a rule hilly lands would suffer from any other kind of weeding; and though selected weeding might be tried he deprecates less frequent weeding. "E. W." would prefer selected weeding to thoroughly clean weeding; but doubts if coolies could be got to carry out the selection properly. "M" is more unequivocal in his opinion that weeding is overdone, especially on steep land and wind-blown ridges, as a bare surface cannot fail to suffer during the monsoon. He therefore favours selected weeding. Not so "O.Y.A." who thinks regular clean weeding the cheapest and therefore the most labour-saving, though selected weeding would be better husbandry. "Lowcountry" (with the qualification that there is too much scraping), "G," "T. Koko" and "Dimbuldanda," all favour clean weeding as the best and most economical; while the last-mentioned pleads the further advantage, that coolies are generally more contented on a clean estate, evidently sharing master's opinion, that weeds are pernicious wherever they are met! None of our correspondents have had experience of digging in any other growth planted between the tea, and most of them are averse to any experiment in that direction.

On Drainage there is less difference of opinion —some of our correspondents being content with their drains, others suggesting minor modifications, such as the growth of a grass that would not spread and silt pits in the drains at intervals. "C.A." however, condemns the present system of drainage, but cannot suggest a better at a reasonable cost. The objection against cuscus, that it develops a fungus in the roots, deserves investigation. We have not heard of it before, and it may be due to purely local causes. Hedges of tea above roads—and why not above drains?—are said to be popular in parts of Dimbula as a preventive of wash. The importance of gardens in conciliating coolies is generally admitted. Goats and cows are suggested as an auxiliary by one planter,—so that we may develope by-and-bye, to the proverbial "three acres and a cow"!; another, a present once in 6 months of a Spinning and Weaving Company's cloth for good pluckers, and a present once a year for all; while from more than one comes the caution, that the cooly need be only treated justly, and a good day's work got out of him. That is, however, the special difficulty of the time, as "G." suggests. In his view, the cooly now does no more than half the work he did eighteen years ago and even in the plucking of leaf there has been a falling off within the past 8 years; and he refers it all to too frequent cases in Court and the ultimate decision against the Master. Yet, "Lowcountry" has had his coolies and kanganies for 12 years without trouble! The opinions on Bazaars and Taverns are of the familiar description, and present no special features calling for comment.

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*(Letters Continued.)*

No. XXXVI.—Lowcountry.

(1) I have erected many wire shoots and firmly believe in them for all transport purposes where their gradient admits of a reasonable delivery *i.e.* where not too steep—1 in 6 from point to point is a good all-round gradient though I have erected shoots as flat as 1 in 15. These, however, require runners of larger diameter to do good work, leaf is not damaged if properly packed, that is the loads should not exceed say 56 lb. It depends, of course, largely on the gradient of the shoot how many lb. one can send down without jamming at the end.

(2) No, I know of none (save wire shoots) of any importance.

(3) No. I suppose, I am one of the few planters who have had practical experience of tramways as I have had laid three miles of 2 feet gauge. No doubt circumstances exist, with reference to situation, &c., &c., where their adoption might with safety be recommended, but in the "vast" majority of cases, there is nothing to touch the cart road and bullock bandy for economy and serviceableness, and the native thoroughly understands this means of transport.

(4) No doubt of it. The trouble is that, in every case, you must find out what weeds, in your particular locality, may be left with advantage and what must be eradicated and educate your labor accordingly. The Indian system of leaving everything and holing in will never do for this country, but I could fill a page or two of foolscap on this subject!

(5) I don't believe in too long an allowance of moss—it tends to "sour" the soil.

(6) For five years, on Labnkelle estate, I cultivated a creeping grass which was the most admirable prevention of wash as well as doing no harm to the tea I have ever seen. I eradicated all other weeds and let this grass spread. It died down and lay upon the ground like hay in the dry weather and grew again in the wet. It is common in Ramboda and Nuwara Eliya especially on Oliphant. I don't know what has become of the experiment since I left the estate in 1892. Probably treated like many another idea as "a' rot" by my successor!

(7) Yes this is good and I have seen it adopted advantageously though I have never tried it myself. I have, however, used "guinea grass" for the same purpose, because it killed two birds with one stone and afforded cattle and horse feed as well as stayed wash.

(8) Factories are not yet so well arranged as they might be; tea too often in course of manufacture being carried 'back" from machine to machine, instead of coming in at one end of the building "leaf" and leaving at the other "Tea." Where water power is abundant, we want firing by "electricity" to save fuel. This can and "ought" to be done. Dear fuel and continued squeeze in prices will no doubt bring it about.

(9) Coolies' needs and wants have grown since tea came in, but their pay has remained stationary. I am strongly of opinion that we ought to pay them more, and the heavy Coast Advances all over the country, (the greater proportion of which will be lost) simply mean that the cooly has obtained, in this form what would have done more good in the shape of "less advances and better wages." Sit on coast advances and pay coolies monthly should be the motto and at better rates.

(10) No, nothing of the kind, you can't drive labor in this direction. Coolies will go where they can meet the biggest crowd on Sundays, and have a yarn, and though you put Caddies just outside their lines they will sooner walk miles to get to the centre where the crowd congregates.

(11) No, I don't object to Ramasamy having a drink and it is better to know where the liquor shops, at which he drinks, are and that they are duly licensed. What is needed, however, is that some steps should be taken to see that only good liquor is dispensed and not, as is too often the case, a vile decoction, ruinous to the health of those who drink it, instead of sound arrack.

A. F. C.

### No. XXXVII.—High District.

1. No actual experience except for firewood, but propose, having an overhead-wire-tramway for transport leaf from several estates to factory, and believe this is just the kind of thing required to economise cost and labour, especially where labour is most required.

2. I know of nothing special for this.

3. Have not gone into the cost of this, and much would depend on cost and lay of land, etc.

4. Only where mamoties and scrapers are used and when not done by hands.

5. No. Certainly not; grevilleas, etc. Trees should be planted on road sides and on shuck hills, etc., the falling leaves would do good and the timber be useful.

6. No. But heard of "Scotch thistle" having been tried on one of these estates, years ago, and saw a few here and there for a time, but they have long since disappeared. It was supposed they would have kept down the weeds and taken their place. I fail to see much advantage even though this had been successful

7. *Close* draining when thoroughly done and rocks all cleared out and leading drains and roads, etc., fitted to meet all this, is quite sufficient to stop all wash I have found, but it must be *done well* and not half finished.

8. —— —

9. Let them have gardens of limited extent; they like them, but this does not positively keep them to the estate.

10. No. I would not multiply bazaars, but prefer a regular market for all, not far off, but certainly not too near. My objection to bazaars too near is—the amount of stealing in firewood, grass or anything the coolies can lay their hands on—that goes on when this is the case. Also if large properties, there might be with advantage estate dispensaries.

11. We have one not far off and I totally disbelieve in allowing one; it is only a cause of general evil, gambling, drunkardness, etc., and it is, I consider, absolutely unnecessary. W. B. J.

### No. XXXVIII.—Medium District.

(1) Shoots save a lot of labour, and in many cases some pay themselves. Might be much more used. Don't think they damage leaf worth speaking of.

(2) None that I know of.

(3) Can't say: but coolies' wages are low, and engineers' are high, and a tramway would cost a lot. It would all depend on the outlay required, as to whether profitable or otherwise; a big Company should try.

(4) No.

(5) No. At least on old estates. Tried it once, and that was enough. Leaf returns fell off, and the saving in weeding was gone before you could wink.

(6) Never tried but would strongly advise another fellow to try.

(7) Present system of draining works well enough: as the best of the soil is soluable, trapping would leave the silt which is not much worth. Mud taken from a dam, is an admirable top dressing, did well for coffee; does well for tea.

(8) Strict supervision, and *every* cooly doing his full share of work would help a number of estates. It is a bother, and worry to see to this, but it pays well.

(9) Giving perquisites spoils the cooly, it is like setting a beggar on horse-back. Kind, firm, treatment, readiness to *re* consider decisions, keeping in touch with your force, and a joke thrown in now and again go a long way to cause content.

(10) More boutiques mean more Moormen, and where there is saleable produce, the close proximity of such gentry is to be avoided. If the estate ran its own botique it might be difficult, but tea planters have enough to look after already.

(11) I suffer from liquor shops licensed and unlicensed, with rascally toddy-sellers to boot, results gambling, stealing, lawlessness; had a set of lines burnt down by a drunken rascal; and thieving; would vote for the abolishment of liquor shops, or their reduction, and a tax on toddy trees, anything to save my labour force from the temptation to drink, and the evil results which follow.

HANTANA.

### No. XXXIX.—High District.

(1) Certainly saves labour on long estates, and does not damage leaf if rightly managed at the receiving end.

(2)——

(3) Don't think tramways would be cheaper than cooly transport.

(4) Estates upcountry must be kept clean; for if allowed to grow, the hoeing of weeds on our hilly land would cause more loss of soil than ever.

(5) Selected weeding would be a good experiment.

(6) Have been recommended to try a crop of clover, but abstained, as digging it in would also loosen the soil.

(7) Rows of cuscus grass would be good on steep land. On gentle slopes the litter from grevillea trees is a grand prevention of wash.

(8)——

(9) Anything by which a coolie can make money renders him more willing to settle on an estate, therefore a garden and a cow, though bothersome, are to be recommended.

(10) A coolie will go to his favourite boutique, whether near or far away, and prefers a village, where he can gossip and amuse himself.

(11) Drinking is very largely on the increase; but the idea is always held that if public liquor shops were abolished, private and illegal ones would supply an equivalent quantity. A. V. R.

### No. XL.—Southern District.

(1) To a certain extent the leaf *is* damaged. Unless there was *great* saving of labour, I should prefer not to shoot leaf.

(2)——

(3) No, I do not think so. In *exceptional* instances this might be done.

(4) Yes.

(5) I should advise hand weeding only, on ordinarily clean estates. It is "carandy" weeding and *scraping* which ruin. Mosses to a certain extent *are* left, but not ferns &c.

(6) I should prefer to see results before saying.

(7) Yes, I think not. The cuscus grass would be the only thing benefitted by the surface wash. It would not prevent the soil at the tea roots being washed down to the next drain.

(8) Thoroughly good *supervision* perhaps saves more labour than any method one can devise off-hand.

(9) Most have gardens who care to. Good warm lines and comfortable. Inducements in cash plucking over and above task for the day. A wholesome regard and confidence in their Durai.

(10) One or two bazaars on the estate are a great institution if properly worked even by the Superintendent and each cooly's account kept regularly and explained monthly and signed by him. It is the Chetties and Moormen who ruin labour, and unsettle them. It is they who compel coolies in many instances to ask a "tundu," or fraudulently obtain their advances to procure coolies from the Coast.

(11) No liquor shop on either of my places, but villages are too close, which is as bad as any liquor shop. I am afraid if liquor shops were abolished the coolies would migrate to where they *could* indulge in drink *i. e.* villages &c., &c. S.

### No. XLI.—Kandy District.

(1) Have used wire shoot for the last 5 years in sending down leaf to factory, little or no damage to leaf, provided you have a good buffer of grass to meet the bag.

(2)———

(3) Would probably be too expensive, much cheaper to have cart roads wide enough for single bullock carts.

(4) No, as regards coffee.
(5) No, you would never get coolies to discriminate between the different weeds.
(6) No.
(7) Fairly so, would have more water-holes cut.
(8)———
(9) Yes, here coolies have their garden but few take the trouble to cultivate them.
(10) No, certainly not.
(11) No, no. 1 think the amount of drunkenness amongst coolies greatly exaggerated. T.C.H.

## "THE GREVILLEA ROBUSTA" IN THE PLANTING DISTRICTS OF CEYLON:

### BIG TREES; AND WHAT THE LITTER OF LEAVES MIGHT HAVE DONE FOR COFFEE?

A planting correspondent writes :—

"*Re* your editorial note about size of Grevillea trees, there are six very old trees near my bungalow. Mr. ——— told me they were large trees when he came to the district, 26 years ago. I measured the circumference of them yesterday and find the largest stretches the tape at 6ft. 2in., a foot above the ground."

Well, done we say! The size given is not far from the maximum size quoted of 8 feet in circumference. The trees referred to are on a well-known Kotmale estate, and cannot be over 34 years old (if so much) because as "Senex" showed the other day, no plants were issued from Peradeniya Gardens before 1862 or 1863.

In this connection, it is of interest, while noting the general testimony to the value of the "grevillea" planted in tea fields, to ask whether, if it had been generally adopted as a shade tree in the coffee era, its presence and beneficial influence would have delayed, or prevented, the ruin of our old staple? One proprietory planter writing from a high district expresses his opinion on this point as follows :—

"I know by practical experience that the good done by *grevilleas* is great. Every acre of tea on our ——— places (naming an old coffee district) has been planted with them, and I am planting up this estate as fast as I can. I think there are many acres of coffee that have been cut out and planted with tea, which, had we known the value of grevilleas, would still be bearing paying crops of the old staple."

Has this been tested at all on any of few coffee fields still remaining to us? Or is it too late, even now to make an experiment? What does "Senex," as an old coffee planter, say to the use of grevilleas among coffee?

## THE NYASSALAND COFFEE COMPANY, LD.

A general meeting of the Nyassaland Coffee Company, Limited, was held on the 25th Sept. at the Registered Office of the Company in Baillie Street. Mr. G. K. Deaker presided and the others present were Messrs. F. Macindoe, W. Shakespeare, J. H. Carson, R. D. Carson and H. Creasy. Mr. Jameson was represented by his attorney Mr. Macindoe. The following report was adopted :—

Superintendence.—Since last year's report was presented to the Shareholders, the Directors regret to report that Mr. G. M. Crabbe had to resign his position owing to ill-health, Mr. L. T. Moggridge was appointed in his place, and with Mr. S. Robins looks after the Company's interests in Nyassaland.

Progress of Work.—During the financial year which closed in Nyassaland on the 31st March, 1897, 240 acres were opened and planted, making a total planted acreage of 250 acres.

Owing to the failure of a large nursery which was destroyed by grub, the expenditure on plants has been more than anticipated. A small consignment of seed from Brazil also proved a complete failure, none of it having germinated.

Estimate for season 1897-98.—The Superintendent has estimated for a further 250 acres to be opened and planted this year, but the Directors hope that he will be able to manage at least 500 acres, and have advised him accordingly. Labour is reported to be plentiful, and the only difficulty is the securing of an adequate supply of plants. Should additional European supervision be required, the Directors have authorized the Superintendent to engage that on the spot. The health of the Superintendent and Assistant Superintendent, the Directors are glad to report, is fairly good.

Purchase of Land.—During the year the title for the 2,000-acre block arrived, and the purchase was carried through. The Company now owns 3,476 acres in all, which was the acreage stated in the Prospectus to be purchased.

The negotiations for the acquisition of an adjoining estate in partial bearing referred to in Directors' previous report fell through, and the money in hand will be devoted solely to the development of the already purchased land.

Mr J. H. Carson retires by lot from the board of Directors, but is eligible for re-election. It will be necessary to appoint an auditor for the ensuing year.

CARSON & Co., Agents and Secretaries.

## PLANTING NOTES.

ROYAL GARDENS, KEW.—Bulletin of Miscellaneous Information. Contents for February and March, 1897 :—A Lily Bulb Disease; Tengah Bark; West India Sugar Trade; Prices of Home-grown Timber for 1896; Myrrh; Botanical Exploration in Yunnan; Kino from Myristica malabraica; Cultivation of Cotton in Egypt; Papain; Miscellaneous Notes.

THE NYASSALAND COFFEE CO'S Directors have not a very bright account to render of their stewardship so far; but they have not abated one jot of their faith in the enterprise and hope to have 500 acres added in the current year to the 250-acres already planted with coffee. Well one.—that area should give a fair trial to the capabilities of B. C. Africa.

EXPEDITION TO TORRES STRAITS AND OCEANA.—At the sitting at Toronto of the Anthropological Section of the British Association (for which he is Secretary) Professor Haddon—according to the London *Times*—presented a report "on the necessity of the immediate investigation of the anthropology of oceanic islands." Next Spring Professor Haddon is to renew his acquaintance with Torres Straits and South Pacific isles in order to finish his investigations there. The Council of Cambridge University have made him a grant of £300 for this Expedition and while he will be in command he will have five or six assistants. From a correspondent's letter on the subject we quote as follows :—

Mr. Ray, the greatest living expert on the languages of the Pacific, will study the languages. Two young Cambridge honours men (medical)—very clever and extremely cultured—will more particularly study the physiology of the senses and experimental psychology. This class of work has never been done on savages and will be quite a new line of research. Another man is an under-graduate, a History student, and a first-class photographer who has published a book "Through Egypt. With a Camera." The two medicos are rich and pay their own passage money there and back, (100 guineas each); and another £400 is needed which will have to be raised before the party starts. Savages are fast disappearing and the work must be done at once.

## CEYLON *VS.* JAVA:

### COFFEE CULTURE IN EAST JAVA BY CEYLON PLANTERS.

### COFFEE IN QUEENSLAND.

There is really no comparison between the extent, population and natural resources of Java—one of the richest islands in the world—and Ceylon with its comparatively poor soil and scant population. Nevertheless, for political reasons, the British Government was glad to exchange Java for Ceylon with the Dutch at the peace of 1815. It was rightly felt that the geographical position of this island made it indispensable to the Power holding India.

At the last Census in 1891, the Western Province of Ceylon was found to be occupied at the rate of 532 persons to the square mile; but at the other end of the scale, we had only 19 to the mile in the North-Central Province. Even in the Western Province there is still a considerable area of unoccupied land, under forest or low jungle. But if the whole island were occupied at the same ratio as this province, Ceylon would have in its area of 25,333 square miles, a population of 13½ millions—which is probably, over rather than under the maximum population reached in the palmiest days of native rule from Anuradhapura.

Let us now turn to Java, and we find from the *Stateman's Year-book* that, while the Dutch claim to hold in their Netherlands Indies (including large divisions of New Guinea and Borneo) no less than 736,400 square miles of territory with a population of 33 millions, the gem of their "Indies" isun d of in "Java and Madura" covering 50,554 square miles with a population of over 25 millions. Java, therefore, with double the area of Ceylon, has more than eight times our population! Of Europeans, Java has four times as many as Ceylon. Indeed, Java on the average is as thickly populated as the South-western division of this island, while its soil is far superior and its means of communication are not one whit behind. At the end of 1894, Java had over 1,000 English miles of railway open, and by this time has probably four to five times the mileage existing in Ceylon. It is no wonder, therefore, that British capitalists have been attracted to Java, and more especially, that Ceylon planters partly because shut out here from further investments through the embargo laid on Crown lands, but more especially in order to try coffee, rather than tea, in a new division of a country with virgin soil—should have found their way to Java.

Our attention has been called to the subject through information which has reached us, respecting the success of the coffee enterprise already undertaken by several well-known Ceylon proprietors in East Java. Messrs. D. and J. R. Fairweather, in association with Mr. J. H. Starey, took up a block of 4,000 acres in that quarter, of which altogether 1,300 acres have now been opened as Glen Nevis estate with "Arabian coffee" in successive clearings which range from one, two, three to four yea's old, the largest (about 500 acres) being in its third year. That the venture is proving a success may be judged from the fact that the crop gathered this year aggregated 6,000 cwt. The labour supply is described as ample, though the rate of pay—the standard being a gold one in Java—is not quite so cheap as in Ceylon. But the Javanese and Madurese employed are of a manly type and do good work. Not far off is the block taken up by Messrs. Rutherford, Todd and Talbot—some 2,000 acres, of which 300 to 400 acres have been planted, the oldest coffee being over two years. Whether Messrs. Welldon and Dunsmure are to invest in the same division, as the result of a recent visit, is not known to us at present. Elsewhere in "old Java," if we may so call it, Mr. A. E. Wright and a relative have taken up an existing estate and are well pleased with their tea as well as Liberian coffee and cinchona. Everywhere there is the same rich volcanic soil; and while the last-named gentlemen are in the midst of the well-occupied planting districts commanding road and rail, the locomotive line constructed through the heart of the island had, at last report, got within a few miles of that part of East Java where Glen Nevis and its sister estates are situated.

So far, we have been writing on what may seem partial information, although the figures given are beyond dispute; but we are in a position to add the opinion of a competent and disinterested observer by quoting a letter from Mr. Donald Mackay to Mr. D. Fairweather, which has been courteously placed at our disposal (to be followed, we trust, by another after Mr. Mackay has actually gone over Glen Nevis plantation). Meantime, here is what he writes:—

Soerabaya, Java, Sept. 7.

"I arrived here on the 6th yesterday, Mr. Schiff met me and has shown me every kindness. I find however that the direct overland route to the Glens involves a very rough walk over the mountains and disabled, as I partially am, from a severe attack of lumbago, I cannot face that part of the journey and must wait departure of local steamer on 13th for Banjoe wangi. This will of course involve a much longer stay in the island than I anticipated, but as I came to see the Glens I am unwilling to leave the principal part of my journey unaccomplished. I expect to be back in Batavia early next month. I have been through the curing mill here and find it crowded with "Glen Nevis" which has produced a fine bold parchment superior to anything else in the place. Reckoning roughly and mentally what you have had this season, I make out something like 10 cwt. per acre which is simply enormous for coffee of four and three years old and speaks volumes for the soli and climate. It is possible the trees may have overdone themselves this year in giving this wonderful crop which I believe excels anything known before in the is land. I shall be interested in seeing the condition of the trees after bearing such a heavy crop. It is unfortunate I am so late, as crop is all over and I shall be seeing the trees at their worst."

We do not expect that Mr. Mackay will find much the matter with Glen Nevis trees even after bearing so heavy a crop, considering the depth and richness of the soil. So far, we understand, the Dutch authorities have been very considerate, if not liberal, towards the British capitalists. It is their desire that the enterprise by "foreigners" in their territory should, if possible, be located in the one extensive and hitherto unoccupied district; and from all we learn, we should be inclined to pin our faith more to this coffee investment in East Java than to the Dumont Company venture in Brazil.

Mr. J. R. Fairweather, who has been suffering from fever, left Colombo by the Orient steamer for a trip to New Zealand, returning *via* Queensland and Torres Straits to Java, where his brother and partner,

Mr. D. Fairweather—at present managing Yataderia—expects to meet him before the end of the year. If there were time we should recommend to Mr. J. R. Fairweather a visit to the coffee gardens in the Cairns district of Queensland, where soil and climate seem specially favourable to our old staple; while the great difficulty, labour, might be overcome if (as Mr. Wardlaw Thompson reported) the Kanakas in the Pacific Isles, are now very glad to take employment from responsible planters in Queensland. At Cairns, which is in 17 degrees South latitude on the North-East coast of Queensland, there is a railway 42 miles long up to Herberton; but after 6 miles on the flat, in twelve miles of this line an elevation of 1,600 feet is attained through very grand scenery, rendered more impressive by the back-ground of the "Great Barrier Reefs" in the Coral Sea of the Pacific Ocean. Then there are 25 miles across a plateau with good soil. It is doubtless alongside this railway that coffee has been cultivated so successfully, although as yet only to a limited extent. For a capitalist doing business on a big scale, there is probably no comparison between the advantages of investment in East Java with plenty of rich land and good labour and in Northern Queensland with no local labour. But then, in the latter case there is the consideration of being under British rule.

## BOTANICAL NOTES FROM MINCING LANE.

A botanical observer who visited the Mincing Lane showrooms lately gives us some notes of what he saw from his point of view. The goods which cover the tables he writes, bring before our mind within a few yards the three divisons of the vegetable kingdom mixed together, not by any means in accordance with the view of a botanical systematist in the dicotyledonous group we spot kola nuts, the true seeds of *Cola acuminata*, which about twelve years ago were to be had only from their native country, tropical Africa. About the time of the Colonial and Indian Exhibition, in 1886, when some fine fresh samples were shown from Jamaica and other West Indian islands, the cultivation of the plant was strongly recommended by some, and ridiculed by others —the wisdom of the former has since been shown. Coca-leaves, again, the produce of *Erythroxylon Coca*, are a comparatively new product which has thoroughly established itself, and which is a near botanical ally to the kola though belonging to another natural order, *Linaceæ*. Further on we see a sample of guarana, a peculiar substance from Brazil, made by beating up the small seeds of *Paullinia sorbilis*, a close ally to the horse-chestnut, into a pasty mass and then rolling it into thick sticks and drying it. The invigorating power of this substance has been known to the natives of Brazil for a very long period, and even at the present time they use guarana as of old, in the preparation of a beverage by grating a small portion of one of the hard cakes or rolls into a cup of water and drinking the contents. For this purpose they carry a roll of the guarana, and the rough tongue of a fish to grate it upon with them on their journeys. Its introduction into English commerce, like that of kola, is of comparatively recent date. Proceeding from the *Sapindaceæ*, to which guarana belongs, the produce of a leguminous plant next catches the eye—namely the hair from the pods of *Mucuna pruriens*, popularly known as cow-itch, and in commerce as cowage or cowhage.—C. & D.

It may not be out of place to mention a sample of Boldo-leaves (*Peumus boldus*) a Chilian shrub, which was introduced to this country in 1874 as an aid to digestion, and as a remedy in liver diseases. The discovery of the properties of the plant is said to have been made by noticing the beneficial effects on a flock of sheep that were suffering from liver disease. The fold in which they were enclosed have been repaired with two boldo twigs, the sheep ate the leaves and shoots with the result that they rapidly recovered. Some singular-looking dried and shrivelled flowers have also been shown under the name of "Cactus flowers." Though they cannot yet be satisfactorily identified, they probably belong to the genus *Rhipsalis*, a group of fleshy jointed branched leafless plants belonging to the *Cactaceæ*. They are of but little or no use economically, though in Brazil the fruits of *Rhipsalis pachyptera* are reputed to have antiscorbutic and antibilious properties, and in the West Indies *Rhipsalis Cassytha* is used as a vermifuge.—*Chemist and Druggist*, Sept 4.

## "QUEENSLAND AGRICULTURAL JOURNAL."

This is the title of a new agricultural publication, only two numbers of which—those for July and August—have yet been issued. The journal is published by direction of the Minister for Agriculture in place of the bulletins that were issued from time to time. "Essentially of a utilitarian character"—to quote from the journal itself—"The Queensland Agricultural journal will be devoted mainly to the publication and wide dissemination of articles of a popular educatory character. It is not intended that it shall take the place of an Agricultural Newspaper, nor that it shall in any way interfere with the peculiar work of such journals." The bulletins that used to be issued by the Department of Agriculture, Queensland have always been of a most useful and practical character, but the journal now issued while including all the subject matter of the bulletins contains special contributions of much merit, and the letter-press and illustrations help to make it an agricultural publication of a high order. Indeed this new journal and the New South Wales Agricultural Gazette are undoubtedly among the best managed agricultural publications to be met with anywhere.

## PLANTING IN PAHANG, STRAITS SETTLEMENTS.

*(From the Administrator's Annual Report.)*

Of planting, other than rice and the usual native fields of maize and sugar-cane, there has been little. The Liang Syndicate has brought 130 acres of land under cultivation, and has planted it with coffee during the year. A further plantation of 120 acres will be opened up on the same property during the current year. The coffee already planted is reported to be doing very well, and the land selected is said to be exceptionally good. It is to be hoped that this is but the beginning of an enterprise, which, if successful, may greatly benefit this State. It is probable that the superior rainfall on the east coast of the Peninsula will prove to be to the advantage of the coffee planter, but those who open up land in Pahang have still to contend with great difficulty as regards transport. The labour employed on this coffee estate is drawn entirely from Java and Sumatra.

Rami planted on the property of the Liang Syndicate has been favourably reported upon, and it is possible that decorticators will be erected during the current year.

Rami grows well on Pahang soil, but the necessity for its immediate decortication renders it improbable that it will be widely grown for some years to come.

Aloe Fibre.—On page 306 we quote an extract in which a hopeful account is given of the trade in aloe fibre. There seems to have been a continuous demand for the fibre from all parts of the world and the prospects are such as to warrant the statement that the trade affords a profitable field for investment.

## MR. NAFTEL'S REPORT ON DOMINICA.

We have received both from the Ceylon Secretariat (and from Mr. Naftel direct) copies of the "Report of Mr. C. O. Naftel on the Forest Lands and Estates and Agricultural Capabilities of Dominica," sent to us at the request of Mr. Templer, the Administrator of Dominica. The Report was printed after Mr. Naftel left Dominica, so that he had not the chance of seeing it through the press, which accounts for certain aberrations in paragraphing. The Report itself is dealt with rather fully in certain of its aspects, by our London Correspondent on another page; but we may supplement what is there said. To the letterpress is prefixed a topographical map on which are indicated the several divisions with their elevation from 500 to 3,000 ft. above sea level and the rainfall (from 67 to 196 inches) for which there are detailed tables in an appendix. Mr. Naftel's paper is laid out after a very elaborate and satisfactory fashion, beginning with "a general description of the island" (Dominica is shaped like a cacao pod) 29 by 9 miles greatest length and width, the total area being 190,000 acres—or about the total extent of the section of Ceylon between Nawalapitiya, Adam's Peak, the Bopatalawa Plains, Horton Plains and Nuwara Eliya—but the highest peak in the West Indian island is only 4,747 feet. Roads are few and generally bad. Climate, temperature and rainfall are well reported of. So is health and soil—the latter being of volcanic origin and rich. The census of 1891 showed a total of 26,841 persons of whom 335 were white, 6,806 coloured, and 19,700 black. The females exceeded the males by 2,723. The "blacks" go to work freely on estates—9d to 1s a day for men and 6d to 8d for women—task work preferred. Here is a typical extract:—

I think I have now shown that, with its rich soil, good climate and command of labour, Dominica fulfils all the conditions required for the profitable cultivation of most tropical products. What these are I will show later on in this report but I propose first to give some attention to Arabian coffee, as it was at one time the principal export, and might, I believe, have continued to hold that position but that the high price of sugar led not only to the abandonment of the cultivation but to the actual rooting out of the trees. It is the generally received opinion that the abandonment of coffee cultivation here was due to the ravages of a blight; but, that this must be an exaggerated or erroneous idea, is shown by the fact that coffee trees are now found growing in the bush on portions of estates which have not been cultivated for 50 years or more, and that, when relieved of the jungle growth, the old tools throw up strong suckers which crop well as soon as they reach the bearing age. These remnants of the old cultivation are found in almost every district in the Island and such vitality in so delicate a plant as Arabian coffee proves both the fertility of the soil and the suitability of the climate for its growth. The nearest approach to systematic cultivation of coffee that I saw was on Dr. W. Rees Williams's estates Bona Vista and Emelia. These are situated about five miles from Roseau on the Leeward coast at an elevation of between 1,000 to 2,000 ft. above sea level. He has some of the very old coffee there, of which I have spoken, both of the Arabian and Mocha varieties and the very fair crops these old trees gave him led to his planting more. The land is said to have all been coffee in the old days and is generally very steep and rocky. Its rocky nature has preserved much of the soil and much of it has reverted to forest or at any rate heavy bush. It has been opened in three or four small pieces, the largest of which does not, I think, exceed three acres. The oldest is about five years, and the youngest under two years old. Individual trees and small bits in the various fields are good, but other patches, and generally these predominate, are thin and weakly. Some of the trees are evidently wind-blown and it is noticeable that all the trees that are fairly sheltered are doing well. The fields have not been filled up with "provisions" as is usually done here but some bananas have been put in for shade and there are a great many weeds. The most attention that they have ever received is, I understand, five weedings a year.

Of Liberian coffee, Mr. Naftel makes a good report:—

This variety was introduced into the Island during the "seventies" by the late Dr. Imray and a few trees were planted on his small experimental garden St. Aroment. They are now about 20 years old and are still bearing well though they have not been cared for as well as they would have been if there had been a large acreage under the cultivation. The Planters have only recently begun to give much attention to this coffee, many having kept to their old staple, sugar, in the hope that prosperity would return to it. Others, more enterprising, have taken to lime growing which in its early days gave very large profits and still pays well, though the price during the last few years has fallen. There is consequently as yet no extent of land under Liberian coffee, but it is now being seen that it will pay to grow and, I believe, the next year or so will show a good increase in the acreage. There is hardly a place in the Island where it will not thrive and there are large tracts of virgin forest where it will flourish as well as anywhere in the world. The elevation best suited for Liberian Coffee here will be found to be from sea level up to 1,500 ft. but I am not prepared to say that it will not do well even higher than this. There is, however, no necessity to go into lands higher than 1,500 ft. for there are thousands of acres in the Island below this, the best being in the Northern district on the Lower Slopes of Morne Diablotin.

We need not refer to what Mr. Naftel says about "Possible Enemies of Coffee," or on the "proper cultivation of coffee"; and we must postpone our notice of tea, coconuts (nuts sell for only 3s per 100!), nutmegs, other spices, cardamoms, tobacco and limes (a profitable industry for lime juice). There is much under these headings to be quoted more specially for our *Tropical Agriculturist*. For the present we cannot do better than close with the summary which Mr. Naftel affords of the various planting districts, into which he divides the little island, with reference to further settlement, as follows:—

I.—Extensive flat—sheltered from prevailing winds—well watered—suited for Arabian coffee—2,500 to 3,000 ft.

II, III, IV.—Long valleys running into No. 1—suited for Liberian coffee, cocoa, kola, nutmegs, limes & oranges.—800 to 1,200 ft.

V.—Large plateau suited for same products as II, III, IV.—well watered and sheltered.—500 to 1,500 ft.

VI.—Slopes close under Morne Diablotin sheltered—suited for Arabian coffee.—2,000 to 3,000 ft.

VII.—Undulating slopes North of Basin Will—heavy forest—very good soil—parts possibly good for tobacco—excellent tea land—sheltered and well watered.—600 to 1,800 ft.

VIII.—Pagoua Valley—well watered and sheltered—heavy timber—tea land.—900 to 1,300 ft.

IX.—Layou Flat:—large extent of flat land—well watered and sheltered—heavy timber.—800 to 1,000 ft.

X.—Very fine land—particularly suited for Arabian coffee—well timbered and sheltered.—2,000 to 3,000 ft.

XI.—Fine extent of undulating land at foot of Trois Pitons Range—sheltered and well suited for Arabian coffee—1,800 to 2,800 ft.

XII.—Continuation of No. IX.—well watered with rich soil.—1,000 to 2,000 ft.

XIII.—Head of Roseau valley—very broken land but parts are suited for cocoa and Liberian coffee—1,000 to 1,500 ft.

XIV.—Soil very rich—suited for cocoa and Liberian coffee—sheltered.—800 to 1,500.

Though VII, VIII, IX, and XII, all contain rich soil and are generally sheltered, the absence of information about the rainfall makes it difficult to say for what cultivation, besides tea, they are best suited. The rainfall of these districts probably approximates to 200 inches annually.

## COFFEE IN COSTA RICA.

It will be remembered that Mr. J. L. Shand went out to Costa Rica last year to inspect a coffee plantation and large extent of land in private hands. The result was the formation of the "Sarapiqui Estates Coy. Limited," of which Mr. Shand and Mr. Huntly Thring—as representing Ceylon—are directors. This mail brings us information (not from Mr. Shand) of the progress of the Company, which we quote as follows :—

"The first lot of coffee has come and has realized the very good price of 108s for the A mark with an average of 96s for the parcel. I send you a sample of the mark which I feel sure will interest you and friends in Ceylon, the size of bean will make some open their eyes. The colour is not up to the mark, owing to being prepared in a most primitive fashion ; but by next picking matters in this respect will be put right. We are all so far quite content with the outlook and I trust the next year will enable the Company to take a place in the ranks of dividend-paying concerns. All the shares are taken up and I think it will not be easy to obtain any later on when more definite news of the coming crop is to hand."

## BENEFITS OF THE NEW AMERICAN TEA LAW:

## CHARACTER OF THE MERCHANDISE IT HAS EXCLUDED.

The following letter from the Indian Tea Commissioner to a leading New York journal explains very fully the interview with Mr. Phelan (Chairman of the Committee of Tea Experts) which it answers. The headings of Mr. Phelan's interview may, however, be given :—

"No Tea unfit for use Admitted to this Country—The Law has been Rigidly Enforced in all four Ports of entry where Tea Examiners are Stationed—Estimated supplies of Tea this Season."

Also his estimate of tea supplies :—

| | Season 1897-8. | Season 1896-7. |
|---|---|---|
| Greens | 14,000,000 | 16,216,906 |
| Japans | 40,000 000 | 42,626,418 |
| Formosa | 17,000,000 | 18,994,324 |
| Amoy | 200,000 | 1.152,848 |
| Foochow | 3,600,000 | 3,430,327 |
| Congou | 8,000,000 | 13,080,536 |
| Ceylon and India | 3,000 000 | 3,000,000 |
| Total | 85,800,000 | 98,501,359 |

Making deficit for the present season as against last year of .. .. 12,701,359

Here then is Mr. Blechynden's reply :—

THE NEW TEA LAW IN AMERICA.

New York, Sept. 2, 1897.

Editor "The Journal of Commerce and Commercial Bulletin":

Sir,—I have read with some attention Mr. Phelan's remarks on the "Benefits on the New Tea Law," to which you give prominence in your issue of this morning, and I desire to take exception to certain matters of facts and figures, for which you make Mr. Phelan responsible. In the paragraph relating to India and Ceylon teas you quote him as saying : "The importers of India and Ceylon teas made an appeal against the rejection of certain lots for excessive dust on the ground that some of the needle leaf was excluded as dust. By request of the General Board of Appraisers a conference was held between the tea examiner and the Committee of Standards, which resulted in an equitable adjustment of the matter, which arose simply through a misunderstanding of the term 'dust' as contra-distinguished from Pekoe tips and small leaf." The fact is that appeals have been made to the Board of General Appraisers, and those gentlemen, while admitting that the regulations under which the fine leaf teas from India and Ceylon are excluded are opposed to the spirit of the law, appear to consider that their powers are limited in the matter until the regulations are changed, and this can only be done by the Treasury Department in Washington. The committee of which Mr. Phelan is chairman, has not actually met since the "misunderstanding" or misuse of the word "dust" in the regulation in connection with India and Ceylon teas became apparent, and the "conference" between the "Committee of Standards" and the tea inspector, to which Mr. Phelan refers, could not, therefore, have a practical result so far as the question at issue is concerned, so long as the regulations remain unchanged. I, therefore, take exception to Mr. Phelan's statement that an equitable adjustment has resulted. Importers' protests are in abeyance, and the India and Ceylon teas under appeal are still being held over pending an "equitable adjustment."

The flaw in the regulation relating to "dust" is that it fails to lay down a rule by which the examiner shall distinguish "needle leaf." The 16 mesh sieve is admittedly inadequate for this purpose, and is yet the only definite guidance provided by the regulations. It is further admitted that India and Ceylon tea leaf separated by 26 mesh sieve, contains no particles which can be classed as dust in the sense used in the regulations.

I have stated that Mr. Phelan's figures are wrong, and this I will proceed to show. The figures quoted by Mr. Phelan are practically those published by Messrs. James and John R. Montgomery & Co. in their circulars, with some slight differences, to which I will refer. Messrs. Montgomery & Co.'s statistics, and therefore Mr. Phelan's figures, include the imports for Canada, as well as the United States, they expressly omit all indirect shipments, which in this connection means for England. The latter I propose to supply. The fact that the statistics are for all North America should be borne in mind when reading Mr. Phelan's contention that the new law, applicable to the United States alone, is the sole factor in reducing the supply of tea available for Canada as well as the United States. As Messrs. Montgomery's statistics omit indirect receipts of teas their figures for imports of Congou from China are deficient to the extent of the imports of this tea via London (I concern myself only with black teas), Mr. Phelan therefore adds to their figures the round amount of two million pounds for season 1896-7, but makes no allowance from this source for season 1897-8, actually reducing Messrs. Montgomery's figures for the estimated supply by one million pounds.

Curiously enough, Messrs. Montgomery & Co. omit the figures for India and Ceylon teas, but Mr. Phelan makes a statement that the imports for season 1896-7 were three million pounds, and estimates the supply for season 1897-8 at the same figure.

The actual imports of India and Ceylon tea during the year 1896 were 9,681,040 pounds, which is six and a half million pounds in excess of Mr. Phelan's figures. The estimated supply for season 1897-8 is greater than that of the previous year. The actual imports for the half year ending June 30, 1897, are 6,249,608 pounds, more than double Mr. Phelan's estimate of the supply for the entire season and about 66 per cent increase over last year's imports to same date.

The figures I use have been published by accepted authorities, and are open to all in the tea trade.

If the law is strictly enforced it may be that much of the most impure tea from China and Japan will

be excluded from the United States. The deficiency can readily be met with supplies of the unquestionably pure teas from India and Ceylon. If an arbitrary regulation which acts in a manner never contemplated or sanctioned by the law is applied to these teas, and the finest are kept out by classing them as "dust," it will probably be a good thing for those who are importing Japan and China teas. —Yours, etc., RICHARD BLECHYNDEN

## WYNAAD PLANTERS' ASSOCIATION.

AN EXPERT TO DEAL WITH COFFEE AS PROPOSED BY THE UNITED P.A., S. INDIA.

From Proceedings of a General Meeting on Sept. 1.

The last subject requiring notice is the decision arrived at on the employment of experts. We all felt that Mr. Newport's scheme deserved support. The Government of Madras will pay half the expense and the Lorver Pulneys will raise R4,000 to R5,000 for this purpose. Green bug does not at present affect us, hut as it has spread from Ceylon to the Lower Pulneys it may easily spread north as far as coffee extends. Personally we hope it requires a dry district to thrive in and our heavy monsoon will kill it, but that is no reason the U.P.A.S.I. should not afford help to districts that need it.

There was considerable disagreement as to the practical benefit likely to accrue from employing an expert for improving cultivation, and the subject was thoroughly thrashed out in special meetings of those most interested. Eventually it was agreed to meet the views of hoth sides by trying to secure the services of Mr. Cameron to improve the strain of coffee, and also to ascertain if sufficient support could be obtained from Associations and Governments interested to obtain with the help of the U.P.A. the services of an Agricultural Chemist.

## MACHINE-MADE TEA IN AMERICA.

One cannot withhold admiration of the pluck, enterprise and persistency that characterize the work of the agents of the India and Ceylon tea syndicate. They came into the markets of America to stay. Encountering a prejudice, as unreasonable as inexcusable, they have, by patient endeavor, made rapid strides in its overthrow, and succeeded in making it obligatory upon every up-to-date distributor of tea to place Ceylon and India tea in stock. By judicious and well directed advertising they have created demand, and with all classes of the people. Think of the enterprise shown in securing the cover page of the *Ladies' Home Journal*, which reaches 700,000 American homes, and to the unique and convincing ads. in other of the foremost journals and magazines of country, which enterprise is working directly for the henefit of the retail dealer. These teas not only have merit, hut are much more economical than China or Japan growths. It pays the dealer to handle machine-made tea, because the demand is created hy just such striking and suggestive and announcements as that on page 9 of this issue.—*American Grocer*, Sept. 1.

## COFFEE CROPS—1897-98.

It is estimated by W. H. Crossman & Brother that the coffee crops of the world in 1897-98 will be about the same as during the 1896-97 crop—that is, a total of 14,000,000 bags, divided by ahout 8,500,000 for Rio and Santos and 5,500,000 for all other countries, with the possibility that one may be more and the other less, but the total not far from the figure mentioned. If low prices stimulate consumption this year as much as they appear to have done in 1896-97 it will tend to check a decline to the low prices of 1882, when a record of 5¼ cents was made for ordinary, and No. 3 (or fair Rio) sold at 7½ cents. If this year's total supply is as large as estimated it may be that the market will drop to prices made fifteen years ago.—*American Grocer*, Sept. 1.

## JAVA CINCHONA SHIPMENTS.

The exports of cinchona-bark from Java during the month of August have been declared at 697,000 Amsterdam pounds. The following figures show the totals for the past five years up to the end of August:—

| | 1893 | 1894 | 1895 | 1896 | 1897 |
|---|---|---|---|---|---|
| | Amst. | Amst. | Amst. | Amst. | Amst. |
| Month | lb. | lb. | lb. | lb. | lb. |
| of Aug. | 636,000 | 853,000 | 697,000 | 979,000 | 697,000 |
| January to Aug. | 5,376,000 | 5,554,000 | 5,013,000 | 6,029,000 | 5,005,000 |

These figure have created a favourable impression at Amsterdam, and raised expectations of a better unit for the coming auction, at which a small quantity only will he offered. It is rumoured that the German combination of manufacturers contemplate an advance in the price of quinine. The Java works are looking for higher prices, but the figures they quote contradict the conclusions they arrive at in their reports, which state that they are enlarging their capacity to 100 kilos per day.—*Chemist and Druggist.*

## PLANTING IN JAVA, STRAITS SETTLEMENTS AND B.N. BORNEO: THE VISIT OF AN EXPERIENCED CEYLON PLANTER.

At our request, Mr. A. E. Wright, the well-known Ceylonproprietor and Inspector of Estates, has written the following interesting account of his recent trip to the "Far East":—

I left Ceylon on the 5th July 1897, arrived at Singapore on 10th July, left there for Batavia on 13th July, where we arrived on the 15th July, and on 16th went on to Buitenzorg. Mr. and Mrs. Dunsmure and Mr. Welldon accompanied me so far and they went back by steamer, via Batavia, Samarang, &c., while I went up to

THE PREANGER

to visit my interest, there I found everything very flourishing.

Mr. Dunsmure, Mr. Welldon, Mr. Bingley and self, visited a Mr. Motman's

LIBERIAN COFFEE ESTATE

together, the day we were at Buitenzorg, and it certainly was a sight worth seeing, the soil, and growth of trees, and crop was magnificent, and his factory arrangements very complete, and as for his bungalow it was good enough for a Governor-General! You can fancy my surprise at finding a telephone wire connecting Tji Wangie estate with Tji Rengas Station (the rail and telegraph station) a distance of ten miles, for the cost of which we pay 20s a month to the Telephone Company, and they pay eost of plant, erection and for keeping it in repair. In this particular Java is far ahead of Ceylon. Some estates have telephone communication with each other thirty to forty miles apart.

I left Java for Singapore on the 23rd July, arriving there on the 25th and finding that there was no steamer for British North Borneo until the 3rd prox. and on Sir Charles Mitchell's recommendation I took a run up to the Native States, the result of which, was that I applied for a block of 640 acres at

KUALA SELANGOR,

which has been granted to me on very favourable terms, for coconuts, &c. I was not very favourably impressed with the land between Klang and Kuala Lumpur, through which the railway runs, but I was told that this was not a fair sample of the land at all, but had not time to

visit the better parts. Kuala Lumpur is a very pretty place, and their public buildings would do eredit to a town twenty times its size, Mr. Spooner has certainly left his mark there, as I believe he designed and built these buildings by the P.W.D., they are of Moorish architecture, and very beautiful, and well finished.

After spending a few very pleasant days at Kuala Lumpur, I returned to Singapore on the 4th September to find my steamer did not sail until the 6th, when I started for

B.N. BORNEO.

Arrived at Labuan on the 9th, spent one day there, left for Kudat on the 11th, arrived there on the 12th, spent two days there, and went on to Sandakan, 14th, arriving there on the 15th left for "Sahad Datu" in Darvel Bay on the S.-E. side of B.N. Borneo and returned to Sandakan on the 19th and spent four days at Government House where Mr. and Mrs. Beaufort were extremely kind to me, and made my visit a very pleasant one. On the 23rd I left for Maruda Bay in Kudat, where I found some very fine land, and visited some tobacco estates as well. I also saw some good land in Darvel Bay. Returned to Ceylon, 12th Sept. At present the B.N. Borneo Co. have only touched the fringe of the country; the interior is yet unknown. There are great possibilities for this country, but they want men and money to develope it; a young fellow with £2,000, and his head screwed on the right way might do well there with coconuts, &c.

## FORESTRY IN THE ISLE OF MAN.

We have received, from the genial editor, a copy of the Journal of the Isle of Man Natural History and Antiquarian Society, published on September 2nd, 1897, edited by P. M. C. Kermode (M.B.O.U., F.S.A. Scot.), Volume III., Part V. This pamphlet covers a year's proceedings of the Society, and includes a full account of the very successful and instructive British Association Excursion in September last year, in which we took part and the memory of which will always afford us pleasure. But we do not mean to refer to this nor to the many attractions—archæological, geological, botanical or geographical—connected with the Isle of Man and recorded in the pages before us. We wish rather to make one quotation of some practical concern to Planters in Ceylon who are interested in forestry and who should note the very large number of trees (5,500) planted per acre in the Isle of Man in experimental plantations and the object with which this was done. At an excursion to Archallagan, 10th July 1896, (Leader, Mr. G. W. Lamplugh, F.G.S.) we read:—

"Mr. Drinkwater was called upon for some particulars of the experiment of planting the waste land of the Island with trees. Archallagan Plantation was, he stated, planted in 1883 by Lord Loch, being one of a series of three Government plantations—this the earliest, next in order of date South Barrule, and the latest Greeba. Archallagan is about 381 acres in extent, and about 5,500 trees were planted per acre, or in round numbers over two million of trees at the first planting. Of the trees per acre there were of Larch 1,368, Scotch 1,368, Austrian 684, Corsican 684, Spruce 350, and Silver Fir 350, and the remainder hard woods—Oak, Turkey Oak, Sycamore, Ash, Elm, Birch, Beech, Alder, and a few Mountain Ash. The hard wood has almost entirely disappeared. The principle of modern scientific planting is to keep the trees so thick that the branches die off and clean symmetrical boles are formed, the trees being supported by the air space above them rather than laterally. It becomes, therefore, important to consider the relative speed of growth lest one tree should overtop its neighbour, and so stop its growth. In Greeba the trees have been further arranged in groups so that the colours may stand out in the landscape—by which he meant that the principal trees are so placed that when the nurses are thinned out, the remainder will produce a distinct effect—mass by mass. A further point of interest is that the ash and sycamore have been placed to the best advantage for naturally seeding the plantation. Turning again to Archallagan, the speaker continued: You will notice patches where the trees are not crowded, according to my statement of the principles of forestry. You may attribute these either to the character of the soil being unsuitable, or to the fact that the drainage in the particular place is deemed too costly to be worth doing. As to the future value of the plantations, a good deal depends upon whether or not the yield of timber is in excess of the demand or the reverse. Until comparatively recently there has been a reckless destruction of timber. Now, in Switzerland, and I believe in Norway and America, there are regulations about replanting so many trees for each one cut down; and in India great attention is being devoted to scientific forestry. The age is such an inventive one that if the supply runs short before these trees arrive at maturity in some 50 or 60 years' time, some substitute for wood is sure to be forthcoming, and even already paper is used to some extent instead of wood. The Government plantations here are in a purely experimental stage, and are in consequence the more interesting."

## THE DEMAND FOR CEYLON TEAS.

The figures given by Messrs. Gow, Wilson & Stanton in their "blue circular" issued by us yesterday, showing the consumption of teas in the United Kingdom and Export for the first eight months of 1897 as compared with 1896, are very satisfactory as far as "Ceylons" are concerned. The "home consumption" in the period named was 55,951,359 lb. against 52,397,003 lb.—or an increase of 3,554,356 lb. This amount is, in excess of the increase in imports; but apart from it there is also an advance in the quantity taken for Export, thus:—

*Export of Ceylon Tea from U.K. Jan.-Aug. 1896-7*

| | *1897.* | *1896.* | *Increase.* |
|---|---|---|---|
| Continent of Europe.. | 3,692,683 | 2,826,899 | 865,784 |
| United States .. | 1,337,406 | 950,229 | 387,177 |
| Canada .. | 1,095,543 | 825,553 | 269,990 |
| Other Countries .. | 711,844 | 603,854 | 107,990 |
| Total lb. .. | 6,837,476 | 5,206,535 | 1,630,941 |

The total demand-increase, therefore, for the eight months may thus be given:—

| | lb. |
|---|---|
| Home Consumption .. | 3,554,356 |
| Export .. | 1,630,941 |
| Total .. lb. | 5,185,297 |

while the comparative increase in imports was only 3,037,726 lb. This is decidedly satisfactory.

## THE MANURING OF TEA.

There is, perhaps, no direction in which money can be more easily wasted in connection with the cultivation of tropical products, than in the purchase and application of manures. Not only should the fertiliser purchased be tested by the analyst; but also the soil to which manure is to be applied. The planter should know what is required for his tea-fields, as well as the exact value of what he is buying and its suitableness to his own particular case. This is the more especially necessary in Ceylon because of the great diversity of soils in our tea-planting districts. Not only does one district differ from another; but it may be that adjacent plantations require very different treatment. But there is the great temptation among planters to follow some one particular lead; or there is the feeling that for Ceylon tea bushes, "bones and castor cake or fish manure" cannot fail to do good. Possibly not; but it is equally certain that a previous examination of the soil might supply information which would lead to considerable economy or to a great deal more lasting benefit from the application of fertilizers. A planter will tell you, "I have experience to guide me—look at the "great improvement in that field I manured "last year as compared with its neighbour: I "cannot do wrong in following its lead all over "the plantation." Now one of the greatest *temporary* changes we ever saw on a tropical upcountry field arose from its having been all holed ready for manure which never came from Colombo,—so after a few weeks or months, the holes were filled in again, and the apparent benefit in the fresh show of vegetation some months after could scarcely have been greater if an expensive manure had been applied; but the good was but a fleeting one, and we merely mention this to show how unsafe it is for the planter to go by mere appearance. Fortunately, so far as the testing of manures sold in the Colombo or Indian markets goes, a good deal more use has, of recent years, been made of the scientific analyst, and guaranteed analyses are now generally furnished with any considerable quantity of manure purchased. What is wanted now is that the same care should be taken to have the soil examined, and as far as possible to adapt the manure to the needs of the field. But scientific men are the first to confess that guidance by analysis alone is not sufficient. Experiment and observation have also their part to play; only, we have long felt that certain clear directions were wanting in connection with manures of recognised value, to enable our tea planters to make for themselves the needful experiments according to the rules recognised by the best cultivators.

Such clear directions, and a great deal of valuable information, have just been brought together in a Report drawn up by Mr. Cochran with reference to certain standard manures for which Messrs. Freudenberg & Co. are agents in Colombo. This Report, with the clearest possible directions as to the needful experiments in fields, acres, or half acres—counting by bushes—or even smaller plots of trees, is given by Mr. Cochran, so that the planter can make his own experiment with a variety of mixtures named, and compare them alongside of similar experiments with the hitherto more commonly recognised fertilizers for our tea fields. The expense of such experiments need be comparatively little. We are much pleased that this opportunity is made so readily available through the pamphlet about to be published and circulated very widely. We need not, therefore, quote from it; but we would urge every proprietor and manager in the island to take its teaching into consideration and to endeavour to make some, at least, of the experiments defined. In this way we should have the whole question of manuring put on a scientific basis—a result that could not fail to be vastly beneficial to the whole planting community.

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## THE AMERICAN TEA MARKET.

*To the Editor of* THE HOME AND COLONIAL MAIL.

SIR,—Your correspondent "Noreih" advocates the formation of a syndicate to take over the crop of two or three estates at a fair average price, and with the aid of an expert to prepare tea for the American market.

He thinks it is useless to contend in America for an adequate share of the market for our teas on their merits, but says that he is of opinion that the old-fashioned panned and soft liquoring teas are more of the kind to "catch on" in America.

I do not think that your correspondent is correct in saying that this market was gained by making a special tea to suit its requirements. My impression is that the market only took very gradually and unwillingly to Indian tea.

I do not agree with "Noreih" as to the policy of making green tea to suit the United States market. Such an attempt to make something resembling Japan or China tea would be sure to end in failure, and would result in having on hand a tea unsuited to any other market, if the United States people declined to by it, as they probably would. I know of one such attempt to make a light unfermented tea, which was said to be just what was wanted, but, strangely enough, no one cared to buy the parcel of 50 chests.

We have infinite varieties of black tea, soft or rough, weak or strong, from different districts to choose from, and in time no doubt the Yankees will take to our tea, if we continue to offer them our machine-made sorts in place of other kinds prepared by the use of hands and feet.

The actual imports of Indian and Ceylon teas during the year 1896 were 9,681,040 lb. while the imports for the first six months of the present season, ending June 30, 1897, are 6,249,608 lb. or about 66 per cent. increase over last year's imports to same date. These figures have been published by accepted authorities, and are taken from a letter dated New York, September 2, 1897, addressed to the editor of the *Journal of Commerce* by Mr. Richard Blechynden.

They show that progress is being made in the United States.—Yours truly, ANGLO-INDIAN.—*H. & C. Mail*, Sept., 17.

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## CEYLON TEA SHARES AND PROPERTY IN THE LONDON MARKET:

## GOOD ADVICE TO CEYLON PLANTERS.

A Correspondent, much interested in our teas and the prosperity of Ceylon, writes from London by a recent mail:—

"The uncertainty of exchange is playing havoc with the tea share market and has curtailed business, for people are doubtful of the effect upon dividends. When the market gets into the present state it is very difficult to realize as so few Ceylon Companies are quoted on the Stock Exchange, and business thereby entails a great amount of correspondence to bring buyers and sellers together. I think however the stringency will be only temporary, for tea is slowly moving to higher values.

"You should, however, waken up Ceylon Planters to the necessity of paying greater attention to manufacture for comparing them with that of India they are not in it as to superior fermentation, rolling and grading of their teas. The broken pekoes of Ceylon, which at one time would have been taken readily by the trade, are now neglected by the larger wholesale houses in consequence of their dusty and broken condition and therefore cannot mix with their higher class of blends and their forces the price down to the inferior grades. I send you four samples, two of desirables and two of undesirable broken pekoes with this relative values. These you can show to any enquirer. I also send four samples of Indian teas for comparison. It is not a matter Ceylon men should shut their eyes to, for the competition with Indians will become keener, because the liquor from Indians is superior to anything from Ceylon, and it is only by careful manufacture on the part of the Ceylon planter that he will maintain his ground and raise his teas to a higher value. At last sale some Ceylon teas were sold at 2¾d and how any one could think of a profitable result from such tea is a mystery, for it would have been better to have put it into the furnace.

"Mr. John Hamilton's advice about packing teas and weighing of packages was deserving of more attention than it apparently received in Ceylon. So long as they remain blind to what materially affects their own interests, no improvement can be looked for. In the early days of Ceylon tea cultivation they showed the way to India, but now they are losing ground and should waken up.

"The value of tea properties, of course, has likewise been affected by the position of exchange and value of teas—to the extent, I should think of 30 to 40 per cent and the high prices lately paid need not be looked for, for a considerable time as Company promoters will not take up anything less than 10 per cent on present results. Several Companies lately floated will have a hard struggle to make ends meet if the present position of affairs remain long as it is."

## CLOVE CULTIVATION AT ZANZIBAR.

From "The Shamba" or "Journal of Agriculture for Zanzibar" for Sept. 1897 we quote as follows:—

Our Pemba correspondent writes as follows:—I believe the clove crop as a whole is a very poor one, but I have noticed that when there is a clove tree close to a hut where the ground is kept more clear of undergrowth, and the refuse from the hut is thrown near clove tree, the crop of cloves is 4 or 5 times as great as on ordinary trees. In fact the tree is full of buds. This seems to show that careful cultivation and manuring will greatly increase the yield of cloves. Some of the trees that are being picked are very much damaged already, which will probably injure next year's crop. The buds are still being dried in the old rough and ready way. Nevertheless I have found some very nice clean and dry samples of cloves which if they could reach the market in their present condition would sell well.

I have been making some experiments in drying cloves in a small way with interesting results, though of course further experiments might show my present conclusions to be worth very little. So far, I incline to think that the buds should be gathered *pink*, not *red*, or else they will burst open in drying. They should be dried in plenty of air and wind with some sunshine. My best sample No. 4 is about equal to Penang but small. The samples were gathered in a very poor plantation and the buds were small to begin with.

Experiments in Drying Cloves in Pemba, August 1897.

| No. | Condition. | Method of Drying. | Result when Dried. |
|---|---|---|---|
| 1 | Red and fully grown buds but not opened. | Under cover from rain and dew, but exposed to air and wind and about 5 hours sunshine per day. | About 20% opened into flower 10% of the flowers came right out. 75% were striped and spotted with light brown lines on lower part. Sample poor. |
| | Pink. | In broad daylight with all obtainable air and wind but *no* sunshine. | None damaged. Heads brown other parts chocolate colour sample good but small. |
| 3 | Almost Green. | Same as No. 2. | None damaged, heads brown other parts darker than No. 2 and rather smaller, otherwise good. |
| | Pink. | Same as No. 1. | None damaged, heads light brown other parts redish brown—also rather small—Best sample —except for size about equal to "Penangs." |
| | Large and Red. | In dull light with free air but no wind or sunshine. | About 6% opened into flower 30% discoloured with light brown lines and spots—the rest almost black. Sample large but poor. |

Nos. 2. 3. 4. Were gathered from a poor plantation and were small buds.

## COFFEE IN WESTERN AFRICA

has begun to suffer much from "borer." The following is from "Kew Bulletin":—

Extract from a letter, dated, Aburi, 6th January, 1896, from the Chief Justice to the Governor. I came up here on Saturday, and on Sunday morning I looked round the coffee. It is in a deplorable state. The Arabian coffee apparently likes the soil and climate, but is literally ruined by (I think) a boring grub, which enters near the bottom and makes a hole rootwards, thereby doing fatal injury to the trees. Practically all the Arabian coffee looks wretched. I never saw anything looking better than the Liberian coffee. It looks superb. On closer investigation I found about two trees out of five attacked by a boring grub, different, I think, from the grub which attacked the Arabian coffee. This grub has only lately begun to attack the Liberian coffee, and you can see trees laden and breaking down with fruit getting yellow from the effects of the grub; some are dying, some dead, all due to the boring grub. The natives see or will soon see it, and will abstain from planting coffee. Considering that this is an agricultural country, and that soil and climate appear to suit the Liberian coffee to perfection, something should be done to try and defeat the grub.

On specimens and information sent him, Mr. Walter F. H. Blandford furnishes a long report to the Colonial Office; much of what he writes is familiar to us in the East, but there can be no harm in repeating hints that are of use in

respect to the insect enemies of more plants than coffee :—

The following points in the life-history of the borer should be accurately made out :—

The *season* at which the perfect beetles appear. This will probably stand in some relation to the dry and wet season.

The *habits* of the perfect beetles, their flight time, place of rest during the day; their tendency, if any, to frequent flowers, oozing sap, diseased trees, &c.

The *place* at which they *oviposit*. This is of importance. Probably oviposition is favoured by wounds in the bark. Special attention should be paid to the probability of the eggs being laid at pruning wounds, and the system of pruning adopted should be looked to with this object.

The *length of larval life* and the length of time a tree will withstand injury without succumbing should also be investigated.

The *early signs of injury* should be carefully made out, in order that infestation may be detected as soon as possible.

*General Suggestions.*—The following general suggestions for treatment over and above those already given are based mainly on the assumption that information will be gained on the above points.

*Prevention of Egg-laying.*—All pruning and accidental wounds should be tarred. Possibly egg-laying may be prevented at the usual situations by plastering the part of the bark usually selected for the purpose with clay and cow dung, or a similar mixture, or painting it with lime-white mixed with rice water, to make it adhere. This treatment has proved successful with other species of borers.

*Capture of the perfect Beetles.*—This to be successful must be attempted after study of their habits and time of appearance. It may be done :—

(*a.*) By placing sheets under the bushes, and shaking off the beetles, in the early morning or whenever they are so sluggish as to drop. The beetles should then be collected and killed with boiling water.

A convenient plan of collecting them from sheets is to fit a tin bucket with a wide funnel-shaped lid of tin, furnished at the centre with a short tube. The sheets are shaken on to the lid, the beetles drop through the tin tube, and cannot escape until the lid is removed.

(*b.*) By setting baits for them, and collecting them from the baits. This cannot be done unless their habits show that some kinds of bait will serve to attract.

(*c.*) By providing logs of any tree which they will attack, ringed trees, coffee shrubs which have been condemned and are dying or have been ringed for them to lay their eggs in. These "tree traps" should be provided before the flight period and removed before the beetles in them have bred out, or they will do more harm than good.

*Preservation of attacked Shrubs.*—This can only be done, if at all, by attentive examination so as to detect the early signs of injury when the larva is still feeding under the thin bark. That these early stages can be detected with practice I have little doubt; whether it can be done with sufficient rapidity to make it practicable is more questionable. If such a patch is detected, the bark should be cut away and the larva tumbled out; it will soon die if exposed to the air and light. The cut part should then be tarred. If the patch has been opened after the larva has finished its superficial burrowing, and gone deep into the wood, it might possibly be killed with a wire, or by wetting the burrow with kerosene, which will penetrate. But these methods are not very practicable, and I regard the surface burrowing as the most important. With the exception of these methods the larval and pupal stages are not open to measures calculated to get rid of them. The suggestions made in the foregoing pages cover all the points by which success in the treatment of the borer appears to me likely to be obtained. That they are all practicable under local conditions is unlikely; but they are all measures which have proved of service in other countries and with other host plants

Particular attention is drawn to the necessity for investigating the antecedent causes which may have favoured the infestation, to the desirability of studying the relation of shade-trees to the infestation, to the great importance of destroying all woody material, shrubs, &c., which may harbour the larvæ and are past recovery, to the importance of attending to pruning wounds, and of catching the perfect insects by shaking down.

## PLANTING NOTES.

"Royal Gardens, Kew."—Bulletin of Miscellaneous Information. Contents for April is as follows:—dliii.—Mycologic Flora of the Royal Gardens, Kew; DLIV.—Spindle Tree; dlv.—Miscellaneous Notes; Sir Robert Meade; Sir John Thurston; Seed Distribution; Botanical Magazine; Flora of British Central Africa; Drift Seeds from the Keeling Islands; Algæ in the Kew Herbarium; Broom Root; Snowdrop disease; Canna disease; Double Rice; Sorghum Sugar. Bulletin of Miscellaneous information for May and June has the following contents :—Insects destructive to Plants in West Africa; Fruit-growing at the Cape; Canaigre; Extraction of Gutta Percha from Leaves; Wine Production in France; U.S. National Herbarium; Completion of Flora of British India; Miscellaneous Notes. Bulletin of Miscellaneous information for July 1897, has the following contents :—Marram Grass; Agricultural Depression; Fat Hen in Australia; Eucalyptus Timber for Street Paving; Grafting Sugar Cane; Grama Grass; Flora Capensis; Hand-list of Tender Monocotyledons; Fiji Ivory Nuts; Additions to list of Kew Publications, 1841-95; Miscellaneous Notes. Bulletin of Miscellaneous Information. Contents for August and September are as follows :—dlxxv.—Diagnoses Africanæ, X; dlxxvi.—Miscellaneous Notes; King of Siam; Botanical Magazine; Key Plan; Water Lily Pond; Tampico Jalap.

Timehri.—The Journal of the Royal Agricultural and Commercial Society of British Guiana, June 1897, edited by James Rodway, F.L.S. Contents :—Papers. —Nesting of some Guiana Birds, by C. A. Lloyd; Early English Colonies in Trinidad, by Hon. N. Darnell Davis, C.M.G.; Agriculture in 1829, by William Hilhouse; First Impressions of the Colony, by W. Arthur Sawtell; Tobacco and Cotton Cultivation in the British West India Colonies, by William H. Burnley; Ruin, by the Editor; The Result of Recent Scientific Researches into the Agricultural Improvement of the Sugar Cane, by J. B. Harrison, M.A., F.I.C., F.G.S., F.C.S., etc.; The Life History of an East Indian in British Guiana, by the Rev. J. G. Pearson, Note on the Arrangement of Sugar Cane Experiments, by J.B. Harrison, M.A. &c., &c. Reports of Society's Meetings, from January to June, 1897.

Mr. Chamberlain and Sisal.—It was recently reported says that Mr. Chamberlain had abandoned his sisal plantation in the Bahamas as a losing speculation. The annual report of the Governor, Sir W. F. Haynes Smith, which has just been issued, tends to confirm the general impression that a number of people burnt their fingers over this extravagantly-boomed West Indian industry. The Governor observes :—"The cultivation of sisal plantations is abandoned in some places, whilst in others it is reported to be on the increase. The prospects for this new industry are now becoming more defined, and although it has absolutely failed to fulfil the anticipations once formed of it, there seems to be less reason to fear that it will die out altogether, and some reason to hope that it may in time become a small but well-established industry returning fair profits to those engaged in it. Pine-apple cultivation in the islands is more promising." The Governor reports this industry to be increasing and that large growers are making substantial profits.

COPPERAH GOES UP IN PRICE.—The market in this article has suddenly risen and there is a stiff competition between millers and shippers. The sudden rise is due to the presence of a new buyer in the person of a Nattukotta Chetty, who is purchasing largely for the Calcutta market; which last week remained steady at R39·75 per candy. The Chetty in question suddenly ran the price to R40 75 and the wily boatmen are keen on holding to the the new price, demanding the same from their old customers.—Local "Independent,"

THE COUNTRY NORTH OF KURUNEGALA.—A gentleman interested in the Northern Commission's line of railway, but who has we believe, not been over the ground, writes :—

"People who see no value in the land north of Kurunegala forget that there is there soil, climate, and rainfall, such as would be admirably adapted to the growth of such an article as cotton."

But far better soil and the very climate for cotton is that found between Anuradhapura and Manaar—the "black cotton soil" of Tinnevelly being repeated in part of the Manaar district.

"TOON" TREES.—We are often asked about these and their success in Ceylon. Here is information from a practical planter who has had as much to do with them as any man in the island :—

"There are two varieties of Toon pretty common in Ceylon. One is Cedrela Toona which is generally supposed to be the red, toon but I understand that is the name of the white variety which has been a failure all over the country except at Peradenia, where the late Dr. Trimen said it was a far finer tree than the other. The name of the red variety is Toona Serrata and I think it a very nice tree for wind belts especially if intermixed with grevilleas and the timber is said to be very useful indeed, but I doubt if much or any has so far come into use here."

MANURES AND MANURING (Indian Manures).—The "Agricultural Ledger" 1897—No 8 deals with Indian Manures, their composition, conservation, and application. A note by Dr. J W. Leather, agricultural chemist to the Government of India. The materials dealt with are the materials which are more or less available to the Indian cultivator may be included in the following list:—

1. Cattle Dung and Urine
2. Cattle Bedding materials
3. Night-soil and other city refuse
4. Oilseed refuse
5. Bones
6. Saltpetre
7. River, Canal and Tank silt
8. Green manures
9. Influence of Leguminous crops
10. Sheep folding.

A NEW SOUTH WALES FORESTER ON TREE GROWING IN CEYLON.—We direct the attention of planters and others to a letter from Mr. Rudder of New South Wales in another column. His inpressions of our hill-country and timber-growing are worth having. An upcountry correspondent writes :—

"A gentleman who has been paying us several visits in the past two weeks is a Mr. Augustus Rudder of Sydney, U. S. W., who on his way back from the Jubilee celebrations in London broke his journey at Colombo so as to have a fortnight in Ceylon. Mr. Rudder having served the Government of N. S. Wales for many years in the Forest Department, naturally saw a good deal to interest him in Ceylon. He is to leave Colombo this week by the 'Orruba' for what he now considers his home in N. S Wales, where, though not born there, he has spent 64 years of his life."

Mr. Rudder, it will be observed, recommends two trees that are comparatively new to us—one a Eucalypt and one a Cedar—*E. pilularis* and *Cedrela Australis*. Has Mr. Nock of Hakgala or Mr. Fraser on Abbotsford got either of these growing?

EXTRACTION OF GUTTA PERCHA FROM LEAVES.—The following communication supplements the information already given in the *Kew Bulletin* (1891) pages, 231-239. Extract from letter from Director of Gardens and Forest Department, Straits Settlements, to Royal Gardens, Kew, dated Botanic Gardens, Singapore, September 18th, 1896 :—"I have been down to inspect the little factory where Mr. Arnaud makes his gutta-percha. Serullas has gone back to Paris with endless patents of different kinds, and Mr. Arnaud alone keeps up the business. The leaves are imported in sacks dry from Borneo and Johore. Most of the trees are over-cut in Singapore, and there are no more leaves left, I hear. The leaves and twigs cost four dollars and a half a picul (133 lb.). They are then put, damped with hot water, into a rolling machine, two rollers working against each other, which grind them to powder. The powder is thrown into tanks of water and shaken about. The gutta floats in the form of a mealy-looking stuff, is lifted out by fine copper gauze nets, put in warm water and pressed into moulds. I have samples of the gutta as it comes from the eaves, and the pressed out finished article. It is really a very curious little manufactury. I do not know how long it will last, on account of the difficulty of procuring leaves, which must, I think, sooner or later stop the trade."—*Kew Bulletin.*

THE INDIAN TEA CROP, 1897-8.—We published the other day a special telegram from Calcutta announcing that the estimate for the current year's crop was reduced to 148 million lb., of which 130 million were expected to go to the United Kingdom. But nowhere has the original estimate been quoted to show the actual reduction now anticipated. This is no less than 8,669,112 lb., for the estimate framed in June last gave a total of 156,669,112 lb.—Our evening contemporary was between 7 and 8 million lb. wrong in the figures he gave the other day for the "total output" of the 1896 crop. According to Messrs. Wm. Moran & Co.'s return of 1st June last, the actual crop of 1896 was 148,217,416 lb. of which 16 million lb. went to the Colonies and America. It will be seen, therefore, that the Indian crop for the current year is not expected to exceed that of 1896; while the shipments to the United Kingdom may be 2 million lb. less! Here are the details published on 1st June last :—

We are favoured with the following figures by the Indian Tea Association :—The General Committee have now the pleasure to hand you the following figures showing an estimate of the Indian tea crop 1897.

| ORIGINAL ESTIMATE OF CROP OF 1897. | | Actual Crop. 1896. |
|---|---|---|
| | lb. | lb. |
| Assam .. | 63,359.989 | 59,655,793 |
| Cachar .. | 21.540,153 | 20,401,487 |
| Sylhet .. | 26,762,000 | 25,099,486 |
| Drajeeling .. | 7,644,250 | 7,817,495 |
| Terai .. | 3,734,000 | 3,738,927 |
| Dooars .. | 24,209,720 | 22,073,781 |
| Chittagong .. | 919,000 | 1,030,125 |
| Chota-Nagpore .. | 320,000 | 220,322 |
| Kangra .. | 2,180,000 | 2,180,000 |
| Dehra Dun and Kumaon (Estimate) .. | 2,000,000 | 2,000,000 |
| Private and Native Gardens (Estimate).. | 4,000,000 | 4,000,000 |
| | 156,669,112 | 148,217,416 |

being 8,451,696 lb. over the actual outturn of the crop of 1896. Estimating shipments to America, the Colonies and other ports with local consumption at 18 millions (or say 2 millions more than last year) there will remain about 138½ million lb. for export to Great Britain.

| Revised Estimate :— | lb. |
|---|---|
| Total Output 1897 | = 148,000,000 |
| ,, to United Kingdom | = 130,000,000 |

## "TEA MANUFACTURE BY ELECTRICITY."

The first issue of the new series of the *Indian and Eastern Engineer* is an *edition de luxe* printed on toned paper with numerous illustrations and much instructive letterpress. The most interesting article to us is on the above topic, and we quote it as follows: —

Mr. Davidson Rickie, Electrical Engineer to the British Darjeeling Tea Co., Ld., has successfully introduced electricity as a motive power for the manufacture of tea. This we believe is the first instance in which electricity has been introduced with success for tea manufacture.

Mr. Rickie is also the patentee of a process for the complete manufacture of tea without the aid of fuel, where water power is available within reasonable distance from a tea factory. The value of this can hardly be overestimated when one considers the thousands of acres under tea cultivation, and the numerous gardens with water power available. A wide field for electrical enterprise, and a bright future for electricity in this direction, has now been opened out, and those who are interested in tea will not be slow to perceive the great advantages electricity holds over any other motive power. We will enumerate the advantages hereafter, and, for the present, confine ourselves to a descriptive account of the electrical plant which has been steadily at work from the beginning of 1896, and has proved to be a conspicuous success.

The Thurbo Tea Estate, which covers over 3,000 acres, belongs to the British Darjeeling Tea Co., Ld., and extends from the Mechi River (one of the Nepal boundaries) to the Rungbong River, which flows through the Nagri Valley. The tea factory, of which we give an illustration taken from a photograph, is situated one mile from the Rungbong River at an elevation of 4,000 feet: all the machinery is worked by electricity. The water taken from the Rungbong River, is led by a substantial waterway of masonry to a point where a fall of 56 feet is obtained; from this point 16-inch steel pipes convey the water, down the 56 feet fall, to a 40 H.P. Jonval Turbine (this being one of the best low-water fall horizontal turbines, by Mr. William Gunter).

To this turbine is connected, by belt and pulley, a Messrs. Mather and Platt's Patent Manchester Dynamo capable of generating 30 B. H.-P. indicating 320 volts and 70 amperes. The current of electricity is transmitted by overhead copper wires to the factory; the terminals being connected to a Manchester motor, patented by Messrs. Mather and Platt, and capable of developing 24 B.H.-P. The motor is under complete control, and the speed is regulated by a graduated 10-stop switch; it is also supplied with drop sight oil cups, and Messrs. Mather and Platt's patent carbon brushes, so that, practically speaking, it requires no attention. We learn that this enterprising firm of electricians have further enhanced the value of their electric plants for tea manufacture by their recent patent enclosed motors, which protects the motor from all tea dust. Among other useful productions are their patent automatic brushes, which are absolutely necessary for the varying loads resulting in tea manufacture, during the rolling process.

The machinery driven by the above electric plant comprises—2 Large Davidson Down Draft Sirocco tea driers; 2 Jackson's Patent tea-leaf rollers; 1 Davidson-MacGuire tea packer; 2 Tea sifters; 1 Tea cutter. It also provides for the lighting of the factory throughout by electricity with numerous 16 C.-P. incandescent lamps which are hung from the ceilings and give a brilliant light. The electric lighting of the factory is effected by joining the positive and negative wires for the electric light, to the positive and negative wires between dynamo and motor; the current being regulated by a small resistance box.

The entire confidence which the British Darjeeling Tea Co. place in Mr. Rickie's abilities, and the reliance they place in electricity as a motive power of tea manufacture, is proved by the fact that there is no reserve power at hand in the event of a breakdown; and no doubt can be entertained of the success of the above plant, seeing that such satisfactory results have been obtained, and it is now well through the second season, with no sign of any trouble or stoppage.

We will proceed to enumerate the many advantages to be derived from electricity, as a motive power, for tea manufacture. Firstly, we must consider that most serious question of fuel, always a difficulty, but more specially in the Darjeeling District, where it is difficult to obtain firewood owing to the stringency of the Forest Department, and the enhanced rates for freight on coal on the Darjeeling-Himalayan Railway, and the trouble and cost of carriage of fuel from railway to the tea gardens. Electricity has a great number of advantages over the old style of generating motive power by a steam boiler with its great cost for fuel, when, as is the case with most gardens, Nature is ready to supply ample power, constant and never-failing, in the form of abundance of water, which is running to waste.

It certainly seems almost incredible that those who are striving daily to reduce expenditure, and study economy, on a tea garden, cannot see that they are throwing away a large percentage of the profits in smoke; whereas, by utilizing this water power and adopting electricity, a great economy could usually be obtained. There are, at this present time, tea gardens in the Darjeeling District paying R34 per ton for coal, and R30 per hundred maunds for firewood; at the same time they have abundance of water power within easy distance from the factory.

What are the advantages derived from steam power? Coal or wood is absolutely necessary. There is the constant fear to the manager of a tea garden that the native driver may allow the water to run low in the boiler. The fires must be lit at a certain hour to be ready for withered leaf, and after steam is raised and the leaf is not quite ready, the fires have to be kept back.

The boiler has to be cleaned out occasionally and scaled, which incurs the cost of packing, jointing, etc.

The yearly overhaul to machinery, viz., steam engine and boiler.

The dirt and dust resulting from the use of fuel. These are all disadvantages, and the only advantage steam can claim over electricity is, that it does not require so large a supply of water. In all other respects, electricity proves to be superior.

It is the acme of cleanliness as a motive power.

It can be started and stopped at any moment, night or day, at a moment's notice.

It will run for years without requiring any repairs.

It is more economical than any other power excepting the water-wheel.

There is the great advantage of lighting the factory by electricity, and most of the disadvantages, arising from the use of steam power, are obviated.

The Superintendent can command the electricity at any moment, as he has only to ring an electric bell, and the man in charge, at the turbine house, turns on the water by opening a sluice door, and in 2 to 3 minutes all the machinery in the factory is in motion. There is no necessity to order more or less power, as the ammeter indicates what machine is at work by the resistance indicated thereon, and the voltmeter indicates the speed by the number of volts. No danger can arise from too great a pressure, as a safety fuse would immediately melt and cut off the current, or, in other words, break the circuit; but this seldom, if ever, occurs, and in the event of it occurring, a fresh fuse is always at hand, which can be replaced in half a minute.

We learn that Mr. Rickie is now making arrangements for testing his patent on a large scale; and should he prove successful it will create a revolution in tea manufacture; and it can only be a question of time for the general adoption of electricity.

Another decided advantage of electrical plants is, the ease with which they can be carried. A dynamo or motor can be taken in parts, and the heaviest of these can be carried by eight hill coolies to the

most inaccessible tea gardens in the hills; whereas it would take days of labour and anxiety, with hundreds of coolies, to drag a steam boiler and engine. As a matter of fact, it has been found to be quite impracticable in some of the hill gardens. We would impress on all interested in tea, who decide to adopt electricity as a motive power, the necessity of having the plant erected, and fitted up, at the outset by a thorough, practical engineer, as the secret of success is that electrical plants must be thoroughly put together, and if this is done they will run for years without giving any trouble.

Many who are not conversant with electricity have an idea that it is a dangerous power; that is a great mistake, as the only danger lies in touching the exposed parts which are charged with electricity, and there is no reason or necessity for doing so; but even should this occur, the only result would be a severe shock, as the power required for a tea garden would not be sufficiently strong to cause any serious accident. It has been very amusing to read in the local papers articles headed "The Dangers of Electricity," the writers of these articles appear to forget that, accidents due to electricity are few and far between, whereas accidents from steam are of frequent, we may say almost daily, occurrence. We are confident that such articles appearing in type will not affect the progress of the electricity, and we are glad to see that our enquiries in our issue of last March, "Notes on Electricity" as to "Whether Electricity had been adopted in any of the Hill Tea Gardens," have brought to light the fact that it has been successfully introduced; and we have no doubt that it will eventually, in the near future, be generally adopted, both in India and Ceylon.

There are three illustrations entitled:—Thurbo Factory, Darjeeling; A corner of the Factory shewing Electric Motor and leaf rollers; The Manchester Motor shewing regulator and electric light connections.

As a *Supplement* to the *Engineer*, there is an extremely good photo etching of the effects of the earthquake on Munshai Bridge, Cooch Behar State Railway. Altogether this issue is a splendid one of the new journal, and we congratulate all concerned on its get-up.

## "THE PROSPECTS OF RAMIE CULTIVATION IN PERAK."

### MR. L. WRAY'S ESTIMATE SHOWS A LOSS ON THE CULTIVATION;

### MR. E. MATHIEU—A NET PROFIT UP TO 136½ DOLLARS PER ACRE.

### MR. J. M. MACDONALD'S ESTIMATED PROFIT, £25 TO NEARLY £50 PER ACRE!

### WOULD THE SOUTHERN PROVINCE OF CEYLON RETURN £5 PER ACRE PROFIT?

WE have received a packet of papers on the above subject from the Straits Settlements containing information of an exceptionally interesting character. To the literature on "Ramie" Fibre, its cultivation and preparation, there is literally no end. We are heartily tired ourselves of all the glowing reports and circulars issued by interested Companies in the old country,—of the many new processes and patents which are to make the fortune not only of the holders, but of the producers of the fibre; and of the diverse instructions offered by gentlemen who probably never saw a tropical fibre-yielding plant in its habitat, nor did any practical cultivation in their lives. It has, therefore, become our practice to dispose of all fresh circulars or reports on "Ramie" after a very cursory inspection; but in the present case we have been assisted by a careful summary of available information prepared for the Perak Government by Mr. L. Wray, junr., respecting the yield per acre, the cost of harvesting and preparing, and finally the value of the result. Here is the information as to yield put into tabular form:—

| | Fibre. lb. | Ribbon. lb. |
|---|---|---|
| Forbes Royle .. | 960 .. | 1,280 |
| J. Montgomery (mean) | 986 .. | 1,314 |
| Hardy .. .. | 1,260 .. | 2,100 |
| E. M. .. .. | 610 .. | 1,080 |
| E. Mathieu .. .. | 1,881 .. | 2,508 |
| Mean yield per acre | 1,173 .. | 1,656 |

The mean yield of fibre is therefore a few pounds over half a ton, and ·739 of a ton of ribbon per acre, that is about 14¾ cwt. or 12½ pikuls.

Then as to cost:—

Very little is to be found, in any of the accounts of ramie, of the cost of the cultivation. It is variously stated that one coolie can keep in order 2 to 3 acres of land; while no information is available as to the cost of gathering, boiling, stripping, dying and baling the ribbon. Taking the mean, that is one coolie to 2½ acres of land, or 2 coolies to 5 acres, and the wages at $9 per month, the cost per annum is $43·20 per acre, and per ton of ungathered ribbon $58·45. As I have already said, there is nothing on which to base an estimate of the cost of harvesting and preparing the crop. The process is as follows:—The stalks are cut near the ground, then stripped of leaves and topped. They are then carried to the boiling tanks and boiled for about a quarter of an hour. The bark is then stripped off by hand, carried to the works to dry, when quite dry it is sorted into lengths, and baled ready for shipment. Considering that some 15 tons of stalks have to be treated per acre, I do not think that less than $20 could be allowed per ton of ribbon. This would bring up the cost of the ribbon to $78·45 per ton or $57·98 per acre.

There is then supervision, manure, rent, duty and buildings. The least that can be allowed for this is $10 per acre per year. Taking a 500-acre estate this would be made up as follows:—

| | $ |
|---|---|
| Rent at 50 cents per acre .. | 250 |
| Supervision, $300 per month | 3,600 |
| Manure .. .. .. | 500 |
| Upkeep of buildings .. | 250 |
| Duty on 369·5 tons at 2½% .. | 623 |
| | 5,223 |

The final cost of the ribbon would be $91·97 per ton or $67·98 per acre.

Summing up as to result, Mr. Wray is not encouraging:—

Dr. D. Morris, the Assistant Director of the Royal Garden, Kew, in a lecture delivered on the 30th November, 1896, gives the price of ribbon as £8 per ton in London. It does not appear that more than £7 ($67·20) per ton could be reckoned on for the ribbon, and as by the above estimate it would cost to grow and prepare $91·97 per ton, it would appear that there is a loss of $4·77 per ton or $18·30 for each acre of cultivation. There is another side to this question, and that is for the planter to also be the manufacturer of the finished product, in the same way as sugar planters are.

A reply to Mr. Wray's Report came from Mr. E. Mathieu of Singapore who quotes actual experiments made for two years at Buitenzorg, Java, under the control of the Director of Botanic Gardens:—

"One bouw gives four cuttings in one year, weighing in the aggregate 34,000 kilos of green stems, without leaves and topped."

In English figures this works out:—

One bouw (1¾ acres)=74,000 lb. of green stems, stripped and topped

One acre =42,800 " " " "

He next quotes a series of American experiments; but we do not attach much importance to these, though the tabular results of all the experiments quoted may be given:—

I shall now bring together the figures presented you so far, and put them under tabular form:

Yields of Ramie.

| Countries. | Number of years' growth. | Number of cuttings per year. | Weight of stems, without leaves and topped, per cutting per acre. | Weight of stems, without leaves and topped, per acre and per year. |
|---|---|---|---|---|
| Java .. | 2 | 4 | 10,700 lb. | 42,800 lb. |
| Louisiana .. | 3 to 4 | 2 | 12,880 „ | 25,760 lb. |
| Texas .. | „ | 2 | | |
| California, Kern Valley | „ | 4 | 12,600 „ | 50,400 „ |
| Algeria .. | 4 | 3 | 11,013 „ | 33,040 „ |

It will be seen at a glance that while the above figures present very large differences in gross totals of the yearly crops, yet when they are apportioned into separate cuttings they agree very closely; the relative weakness of the weight of the Java cutting, as compared with those obtained in the States or even in Algeria, being explained by the fact that the latter experiments have been carried on for a longer period than in Java.

Mr. Mathieu is therefore inclined to think that after 3 to 4 years a ramie plantation in Malaya should give in 4 cuttings, 20 tons of stems per acre per annum. Such an estimate we consider most unreliable to work on as a permanency, even on the richest soil and with the best possible cultivation. It may be done on a small plot for a few years; but we scarcely think any practical planter—in Ceylon at any rate—would embark capital with the hope of harvesting 20 or 10 tons of a crop per acre, continuously. However let us see what Mr. Mathieu has further to say in respect of the "yield in fibre." We agree with him as to the great confusion over the different terms used:—

"*Yield in Fibre.*—Turning now to the yield in fibre, here again we have to brush away the ambiguity attaching to the term fibre. It is dubbed ribbon, raw fibre, clean fibre, dry fibre, filasse—without these words conveying any true idea of the standard of purity of the fibre nor of its value in money: and sellers of patents or machines have too often availed themselves of the vagueness of the terms used to impose on the public as to the output of their inventions." Mr. Mathieu adopts "clean dry fibre" and takes as the average of several experiments (chiefly with the Faure machine at Buitenzorg,) an average of 3·75 per cent. He then recapitulates after the following attractive—not to say triumphant—fashion:—

My estimate of yield of ramie stems, stripped of leaves and topped, stands as shown above 20 tons per acre per annum. Green stripped stems yield 3·75 per cent of their weight in clean dry fibre, as sample No. 2, worth £32 in London. Therefore 20 tons of green stripped stems, the aggregate yearly crop of one acre, will give 1,680 lb. of fibre, worth £24 in London. Conclusion: The gross yearly product of one acre planted in ramie in Malaya is £24 in London.

Let us now establish the cost of production of these 1 680 lb. of fibre, and laying them down in London.

| Acreage, 500 acres. | $ |
|---|---|
| Rent per acre .. .. .. | 0.50 |
| Cost of cultivation of 1 acre. trimming and cutting superfluous roots; light hoeings | 30.00 |
| Manure (using the leaves and refuse from decortication) .. .. .. | 4.00 |
| Cutting, stripping of leaves, gathering and carting 20 tons of stems to factory .. | 25.00 |
| Management and superintendence, per acre | 20.00 |
| Decortication: Cooly labour, 1 cent per lb. of fibre .. .. | 16.80 |
| Decortication: Engine-room wages, 1,680 lb.= ¾ day's output .. | 6.20 |
| Depreciation of machinery and upkeep .. | 10.00 |
| Cost of production of 1,680 lb. at the estate | 112.50 |
| Duty 2½% on $112.50 .. .. | 2 70 |
| Pressing, baling, transport to port of shipment, freight to London, etc., $30 per ton on 1,680 lb. .. .. ... | 22.50 |
| Total cost of 1,680 lb. of clean dry fibre laid in London .. .. .. | 137.70 |

This figure of $137.70 should be under ordinary conditions considered a maximum; under favourable conditions, and labour at $6 per month, the expenditure should be much reduced. As it stands, however, it shows that one acre, at a cost of $137.70, brings in a gross return of £24 or $240, leaving a nett profit of $102.30. But it is possible for the planter very materially to increase his profit by partially degumming his fibre himself.

How to gain the last-mentioned advantage with an additional profit of 34·20 dollars per acre, is thus described:—

Degumming, when the gum is yet fresh and fluid, offers very much less difficulty than when it is hardened, as is the case when the fibre is sent simply dried to Europe. Anyone can satisfy himself on this point by boiling freshly stripped ramie in water for, say, one hour; it will be seen that the fibre loses a notable quantity of its gum. If the boiling is kept up for several hours and a small quantity of washing soda added, or soft green soap, the reduction of the gum will be yet more complete; if the boiling is made under pressure in autoclave kiers an almost complete degumming can be obtained; but, beyond the fact that pressure implies more or less complication, it is not necessary nor desirable to carry the degumming so far, because in the presence of a perfectly finished fibre the spinner is apt to suspect the use of injurious chemicals; he prefers, as in the case of hemp and flax, to finish off the process himself with his own particular dressing. The planter, therefore, if he ungums at all, need only concern himself with a partial degumming, limiting himself to extracting, say, two-thirds or three-fourths of the gum.

And then the final conclusion becomes:—

1 acre { =20 tons of stems, stripped and topped
=1,680 lb. of clean, dry fibre
=1,344 lb. of degummed filasse

| | |
|---|---|
| Cost of production .. .. | $163·50 |
| Value in London .. .. | 300·00 |
| Nett profit .. .. .. | $136·50 per acre and per year. |

Mr. Mathieu further thinks that the best market for the fibre is not Europe but China itself, since while he puts the whole production of ramie (China grass) in China at 11,0'0 tons, the export is only 2,000 tons, the rest being used for local manufacture.

Finally among the papers sent us is an estimate from Mr. J. M. MacDonald (of MacDonald, Boyle & Co. London,)—"of the Machinery necessary, to decorticate and degum the produce of 1,200 acres of land, and of the profits to be made from the cultivation of Ramie and its subsequent decortication and treatment on the ground, so as to render it unfit for the manufacturer, in which condition it will readily command £42 per ton in Great Britain for large contracts, and much larger prices for small quantities. In France as much as 2 francs per kilo, equal to about £90 per ton, have been offered; indeed at our mill at Long Eaton we are selling the noils or waste at from 4½d to 5d per pound."

It may be judged from this passage alone that Mr. MacDonald is a sanguine man and that he writes after a magnificent fashion dealing in large figures. He is writing to Mr. T. Gibson, Hon. Secy. of the local Planters' Association :—

In calculating the return from an Estate, I have taken six months as the time required for the plant to mature, but as you are aware, from your experience of Ramie on your Estate at Klang, it matures in three months. I have also taken the product at one ton only for the first six months, but properly planted this may be calculated at 1½ ton, also the product of the second year at 1½ tons, when two tons per acre can be relied upon if the land is suitable. The estimate for machinery does not include buildings. What I should suggest for the consideration of the Planters is that a central factory to degum the fibre should be erected on some suitable spot, and a battery of decorticators placed on each Estate where the Ramie is grown, so that the decorticated fibre only, need be sent to the Central Factory to be treated. Thus an enormous saving in carriage would be effected; the decorticators would be worked by the central factory, and credit would be given to the Planter for the weight of stems decorticated daily, and according to the weight of stems decorticated the amount of his proportion of the profits of the central factory could be determined. The cost of the machinery for the central factory, including working capital for six months, would not exceed £10,000, which will be returned in full with 9 months of the first crop, leaving a considerable profit, and after that the Planters will be receiving at least £25 net profit per acre for every acre under cultivation. By doubling the item for decorticators the output of the central factory could be doubled, the other machinery being equal to the output of 2,400 acres.

We may as well put Mr. MacDonald's sanguine figures on record though we fancy few practical planters will put faith in those referring to returns on working of estate:—

RAMIE IN THE MALAY PENINSULA.

Estimate of cost of necessary Machinery and erection thereof for treating the product of 1,200 acres; 900 being under cultivation, the rest being roads and paths.

| | £ |
|---|---|
| Decorticators, 4 Installations of 40 drums, one installation of 20 drums, with 4-12 HP Engines .. .. | 1,898 |
| Fixing and fitting same with brickwork including sheds .. .. | 425 |
| Degumming machinery, including fittings, &c. .. .. | 1,000 |
| Steam boilers and engine.. .. | 1,000 |
| Soaking tanks .. .. | 250 |
| Chemical tanks .. .. | 250 |
| Water tank .. .. | 100 |
| Steam pumps and appliances .. | 100 |
| Wharf with loading crane, weighing machinery, &c. .. .. | 500 |
| Soap tanks and fittings .. .. | 125 |
| Fittings for treating sheds.. .. | 250 |
| Steam barrel, steam valves and fittings | 150 |
| Belting, say .. .. | 100 |
| Baling machinery .. .. | 500 |
| Sundries, say .. .. | 127 |
| | 6,775 |

ESTIMATE OF THE FIRST 12 MONTHS' EXPENSE OF THE CULTIVATION OF THE ESTATE AFTER PLANTING.

| | £ | s | d |
|---|---|---|---|
| Allowing one coolie for each two acres of land for the cultivation and cutting purposes it will be necessary to employ 450 coolies who will keep down the weeds for the first five weeks, and cut the stems as they ripen, but in case of illness allow for 480 at 6d per day, this will amount per annum to .. .. | 3,208 | 5 | 0 |

COST 6 MONTHS TREATING THE FIBRE, SAY 156 WORKING DAYS.

The first cutting will take place from four to six months after planting, so that there will only be 6 months' produce the first year.

| | £ | s | d |
|---|---|---|---|
| Coolies collecting the stems and delivering to Decorticators, 2 to each 100 acres, 18 at 6d per day .. .. | 70 | 4 | 0 |
| 330 coolies working Decorticators at 6d per day .. .. | 1,287 | 0 | 0 |
| 16 coolies assisting in Mill and Baling and wrapping, at 6d per day .. | 62 | 8 | 0 |
| Chemicals to treat 450 tons at £2 per ton of Filasse .. .. | 900 | 0 | 0 |
| Engineer, 6 months .. | 200 | 0 | 0 |
| Cultivation Manager.. .. | 500 | 0 | 0 |
| Works Manager, 6 months .. | 250 | 0 | 0 |
| | 6,477 | 17 | 0 |

RETURN FROM ESTATE FIRST YEAR.

| | £ | s | £ | s |
|---|---|---|---|---|
| At the end of the first year from Planting it is estimated that the product will be at least 450 tons of cleaned fibre, ready for manufacturer. Taking the sale price of this at four-pence half-penny per lb. only, it amounts to .. .. | | | 18,900 | 0 |
| Cost of producing the above as on other side .. | 6477 | 17 | | |
| Freight £2 per ton .. | 900 | 0 | | |
| Brokerage and Incidentals, 2% | 260 | 0 | 7637 | 17 |
| Working Profit | | | 11,262 | 3 |

The second year the Estate should be in full bearing. and producing 2 tons of cleaned fibre per acre, but for safe calculation we will only take it at 1 and a half tons per acre.

| | £ | s | £ | s |
|---|---|---|---|---|
| Product of Estate, 1,350 tons at four-pence half penny per lb. (£42 per ton) .. | | | 56,700 | 0 |
| Cost. | | | | |
| 450 coolies cutting | 3,208 | 5 | | |
| 18 do. collecting stems and delivery to Decorticators | 140 | 17 | | |
| 230 coolies on decorticators | 1799 | 15 | | |
| 60 do. assisting in Mill and drying and baling sheds | 469 | 10 | | |
| Chemicals £2 per ton | 2700 | 0 | | |
| Engineers .. | 400 | 0 | | |
| Managers .. | 1000 | 0 | | |
| Freight, £2 per ton .. | 2700 | 0 | | |
| Brokerage and Landing charges, say 2 per cent .. | 1134 | 0 | 13,552 | 7 |
| Working Profit | | | 43,147 | 13 |

From these profits the Patentees Royalty of 25 % will have to be deducted.

For the present we would only note one little point of discrepancy: Mr. Mathieu writing on actual experience bases his estimate for Malaya on a 3½ years to 4 years old ramie plantation: Mr. MacDonald begins operations in six months after planting! It is a pity that planting opinion should, we feel, be prejudiced at the very outset by estimates and figures, which seem to us far too glowing. Far better pleased would practical men be to see a well-considered moderate statement work out a possible profit of £ 5 per acre than to be met with over £12 per acre profit the first year and well-nigh £50 of working profit in the second year from a cultivation which, so far as we know, no one has yet tried on a scale sufficient to justify reliable estimates for a plantation at any rate in the Eastern world. Garden experiments are useful as guides; but they do not count for serious estimates on a big scale with experienced tropical planters.

The Southern province of Ceylon has been described by practical men as "a paradise for

fibre-yielding plants" and labour in some parts, is abundant and cheap. But we should be sorry to see any one go in for "Ramie" there on an expectation of more than £5 per acre return—and even then the investment would be a venture as all pioneering attempts in the tropics invariably are.

Since writing the above we have seen it stated that Mr. MacDonald has arranged with a native Sultan (Datu Mahommed) to put 1,000 acres under ramie and that a central factory is to be erected to treat the product after the MacDonald-Boyle process. This undertaking and experiment will certainly be watched with the greatest possible interest. Mr. MacDonald has a wide margin to work on, and we wish him all success.

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## PLANTING NOTES.

Planting and Produce in Trinidad.—The report of Sir Herbert Jerningham of Trinidad shows that the imports amounted to £2,463,525 and the exports to £2,165,820, of which about half in each case belongs to the United Kingdom and the British colonies. Sugar and its products, cocoa, asphalte, and bitters are the chief exports. The total area of the colony is estimated at 1,120,000 acres, of which nearly half a million acres have been alienated, the remainder being Crown lands. The area under sugar cane is 58,500 acres, and cocoa 97,000 acres. The Tobago report, which is annexed to that from Trinidad, is also satisfactory. The revenue exceeded the expenditure, and the island had a balance to its credit at the end of the year. The population of the island at the end of the year was estimated at 248,404, of which East Indians numbered 81,404.—*H. and C. Mail*, Sept. 3.

Fiji.—The last report from Fiji deals wholly with the trade of the islands for the past four years. The trade last year amounted to £677,834, of which, approximately, two-thirds were exports. Of the whole trade more than nine tenths was with, or through, the Australasian colonies, New Zealand taking nearly half the whole and New South Wales the lion's share of the remainder. More than four-fifths of the total trade of the group is carried on at the port of Suva and the remainder at Levuka. The chief imports are drapery, breadstuffs and biscuits, coals, hardware, meats, and a great variety of manufactured goods in small quantities, while the export trade shows an increasing tendency to concentrate around three main staples—sugar, fruit, and copra. When the figures for these are deducted from the whole it is seen that the export of minor products is diminishing. The value of the exports last year was £435,342, of which sugar absorbed £336,929. The area under sugar is increasing, in spite of the unsatisfactory condition of the market, for the sugar industry can only be profitably conducted on a large scale. The export of copra last year amounted to £48,950, which is very much below the average, and only half that of the previous year, while the fruit export—bananas and pineapples, wholly—was £18,490, also a great decline on previous years. But this decline is regarded as temporary only, especially as large areas are being put under fruit cultivation in different parts of the islands. There is a very great number of minor products, the export in most cases being very trifling; the list of them "is more indicative of possibilities than of their fulfilment;" the export of them is "of a more or less casual nature," although there are indications that some, such as coffee and rice, may increase in the near future, as soon as they have supplied the considerable local market which exists.—London *Times*, Sept. 17.

Fecundity of Plants.—Your Monday morning "Echoes of Science" made mention—says a correspondent—of the common Purslane *(Portulaca oleracea)*, a weed common in Ceylon and known among the natives, who use it as a vegetable for their curries, as Gendakola. The plant is put down as a "botanical wonder" in that the average number of seeds in each seedpod was found to be 6,000. From the following (taken from Rhind's Vegetable Kingdom) it will be seen that there are other plants, which, for fecundity, beat the common Purslane:—"The fecundity of plants, in other words, the astonishing number of germs or seeds which they produce, is one of the causes which are most powerful in facilitating their reproduction, and in affecting their surprising mutiplication. A single capsule of the white poppy has been known to contain 8,000 seeds, and a capsule of the *Vanilla* from 1,000 to 1,500: a single stalk of *Zea Mays*, Indian corn or maize, will produce 2,000 seeds; a single plant of tobacco has been found by calculation to possess the almost incredible number of 360,000, and a single stalk of spleen wort has been thought, by estimation, to produce at least a million of seeds."

Is Coffee "King?"—In an article under this heading *The Planter* says:—Coorg, doubtless, has for many years past held the premier position in the industry in Southern India, but there is no denying the fact that even there it is now slowly declining. Leaf disease, borer, and bad seasons are, of course, responsible for this falling off. What coffee planters ought to set about is to try and improve the soil which has had all the sustenance it once contained taken out of it by years of continuous planting. It is better to go on opening up fresh land than to persist in planting and replanting that which has borne fruit a thousand fold more than there was any reasonable right to expect, and then to do it at a loss from year to year. While on this subject it may be useful to glance at the Coorg coffee prospects for the current season. According to an official forecast which has just been published, the Coorg coffee crop of 1897-98 is as follows: Estimated yield at 1½ cwt., Europeans 1 984 tons; estimated yield at 1¼ cwt. per acre, Natives 730 tons; total 2,714 tons. The average crop during the last ten years has been 3,409 tons; thus the forecast represents only a thirteen-anna crop. Viewed in the light of these figures we feel justified in repeating the question which heads the present article.

Yerba Mate, or Paraguayan Tea?—In his last report to the Foreign Office Her Majesty's Consul at Villa Asuncion has something to say about Paraguayan tea. He says: "There are two classes sold, but it is only in the manner of preparation that they differ. The kind known as 'Mborovire' is merely dried over a furnace, and then beaten into small pieces with sticks. The 'Molda' goes through the same process, but is afterwards ground in a mill. The export duty on the former was increased in 1895 from 30c paper to 10c gold, and on the latter from 25c paper to 9c gold per 10 kilos. The revenue derived from this source in 1895 amounted to 471,668dols (£16,845). The Yerba forests, called yerbales, were formerly the property of the States, but most of them have been sold, and are now in the hands of a few capitalists and companies. The Industrial Paraguaya Company, which owns about half of the yerbales known to exist in the country, exports annually about 400,000 arrobas (4,512 tons). The total quantity of yerba exported during the past year is estimated at about 9,024 tons, and the average price per arroba (25) was 11dols 50c paper (7s 8d)."

# Correspondence

*To the Editor.*

## TEA CULTIVATION IN SOUTH CAROLINA, U.S., AND THE PROSPECT OF A PROTECTION TEA DUTY.

Summerville, S.C., 13th August 1897.

DEAR SIR,—I have not received the July number of your excellent *Tropical Agriculturist.* I fear that it has quite gone to pieces in the mail. I recently sent you the Report on my Tea Farm by the Agent of the U.S. Department of Agriculture. The tea-duty must ultimately come and then the success of my work will be acknowledged. —Yours very truly,

CHARLES U. SHEPARD

[The Ceylon tea planters would not at all object to a moderate import duty by the United States Government on tea, as it would far more tend to discourage cheap and impure "Chinas" and "Japans," than the superior "Indias" and "Ceylons." There is no need, too, for Eastern planters to fear Mr. Shepard's little enterprise; for all he can do with his estate of 700 acres—of which, however, only a small area is under tea—with the available labour, will be to encourage tea-drinking habits among his neighbours and an appreciation especially, of really good pure tea, rather than to injure the import trade from Ceylon. The Report sent us is a very interesting one, and will be dealt with later: it is signed by Mr 'Wm. Saunders"—the same worthy officer of the Agricultural Department at Washington who showed us over the offices and gardens during our visit in 1884, and who was specially proud of his solitary tea bush flourishing in the open air (at Washington.) We need scarcely say Mr. Shepard had not then begun tea planting or we should certainly have visited his garden at Pinehurst when we passed through South Carolina.—ED. *T.A.*]

## "GAPES" IN CHICKENS: A REMEDY WANTED.

Sept. 8.

DEAR SIR,—I shall feel greatly obliged if either you or one of your many readers could give me a cure for "gapes" in young chickens I have lost a number of quite young chickens. about a month old from this. I should be most glad to know the cause and cure.—Yours faithfully,

"AMATEUR."

[An experienced Head Servant advises:—"Mix saffron and sulphur well together and rub thoroughly about the head," &c.—ED. *T.A.*]

## COCONUTS AND COPRA.

DEAR SIR,—The question whether it is wiser to sell coconuts or to convert them into copra does not offer the same difficulties as beset consideration of the advantages and disadvantages of the sale of tea locally and of shipment to England. For one thing, the fluctuations in exchange do not enter into the calculation, and then the rise or fall in the price of the article between the shipment and the date of the London sale, is excluded. Whatever millowners may have done when the Desiccating industry was in its infancy, they now recognise the fact that the price of oil is the chief factor in determining the price of copra, and through it of nuts; and they regulate their offers for nuts accordingly. Not only so, but they discount the advantage they offer of quicker returns to the extent of fixing prices which have induced proprietors who are in no urgent need of cash to convert their nuts into copra, though the Desiccating mills are nearer to them than the oil mills; while needy holders have preferred to give the nuts they had unwisely carted to the mills without prior arrangement, at a loss, rather than carry them back for conversion into copra.

It is for these reasons I said in a few lines I sent you last week that estates at a distance from Colombo should certainly send down copra to Colombo rather than nuts. Of course, I mean, as a rule, and under present circumstances when the supply of nuts is ample for all needs—for the slack demand for oil and also for Desiccating mills working full time. If the supply fall rather short of the demand, or is only just equal to it, competition may disturb the fine calculation in prices which is now practised and which may yet induce me to convert my crops into copra though I am not far from Colombo, though I have generally preferred to sell nuts, and though I have benefited more from the sale of nuts than of copra, and though, like a burnt child, I dread fire. When distant estates are requisitioned for nuts, I rejoice, as I know they are getting to be scarce in, and

NEAR COLOMBO.

## CASTOR OIL AND SUNFLOWER OIL.

Sherwood, Haputale, Sept. 13, 1897.

DEAR SIR,—I see there is an article in your *T. A.* magazine for August on the cultivation of castor oil and sunflower seed for their oils. Could not both these be grown to advantage in this island where they abound in the wild state? Is there any difficulty in extracting the oils for commerce?—I am, sir, yours sincerely,

PLANTER.

[We do not know that any systematic attempt has ever been made to extract the above oils in Ceylon; but the natives in the case of castor oil prepare a good deal for their own use after a primitive fashion, and we do not see why there should not be success in a big experiment; the native checku could, we think, be utilized for the expressing of castor oil.—Cultivation of both is a simple matter, though good or manured soil would be required.—ED. *T.A.*]

## TEA PREPARATION AND MACHINERY.

Central Province, Sept. 18.

DEAR SIR,—You ask the opinion of experienced Factory Managers in Ceylon on "Engineer's" letter of 4th Sept. in *Indian Planters' Gazette* on his remark: "a properly equipped withering-house should turn out the leaf at a given hour, let it be wet or dry." No doubt, that is the point to aim at; but there are precious few factories in Ceylon any more than in India that can meet this requirement. There is precious little control over the withering and that is why there is so much Sunday work. With reference to this same letter I should like to know "how many Ceylon planters have got Jackson's Rapids or Brown's Triple-action Rollers with their tops off and 2 feet added to depth of box and fitted up with circular battens?" Davidson's Roller meets this requirement to have leaf beautifully rolled and still keep leaf quite cool.—Yours truly, ESTATE TROTTER.

## TEA PREPARATION—OVER-FIRING.

Dimbulla, Sept. 27.

DEAR SIR,—Replying to the letter from "Indian Planter" there is no doubt that a large quality of tea goes into the market that is over-fired, although it has no taint of burning. This, I think, most often arises from too long final firing at a low temperature, until the flavour is baked out of the tea.

I get the best results from final firing at 220° in a Desiccator, using one chamber only, and spreading the tea half-an-inch thick on the trays. When the tea is slightly heated the odour is rather unpleasant than otherwise, but when hot, all flavoury tea gives off a fragrant aroma; as soon as this begins I think it is time to stop.—I am, your faithfully, 5,000 FEET.

## REFIRING TEA: A QUERY FOR A "PUBLIC-SPIRITED CEYLON PLANTER" IN A HIGH DISTRICT.

SIR,—On an estate at a high elevation where delicacy of flavour is the chief desideratum we find that in re-firing the tea for packing, there is a decided loss of flavour. More strength perhaps, but less flavour is the result of re-firing for packing. Will any benevolent, public-spirited planter who has had experience with high-grown teas kindly offer any suggestions regarding the best temperature, length of time in drier, and thickness of leaf upon the drawers, which have been found to give the best results? I see the suggestion has been made *not* to re-fire for packing and doubtless if the binning of teas could always be avoided it would be very desirable to do this, but where one is obliged to binn the tea for a month or so surely, softness would be the result if the tea was not re-fired.—Yours faithfully,

INDIAN PLANTER.

## CEYLON TEA IN RUSSIA.

Kandy, 27th Sept., 1897.

SIR,—I enclose letter received from Mr. Rogivue, regarding his work in Russia, in pushing, advertising and making known Ceylon tea.—I am, Sir, yours faithfully. A. PHILIP.

Maroseika-House, Lebedieff,
Moscow, 21st August, 2nd Sept., 1897.

A. Philip, Esq., Secretary to the "Thirty Committee" Kandy (Ceylon.)

DEAR SIR,—On my return from abroad, I find your letter of the 23rd July covering letter of credit No. 35/18 of the National Bank of India Limited, dated 22nd July 1897, for £st.500. (Five hundred pounds sterling) in my favour, to be used by me for the advertising of Ceylon tea in Russia. I thank you for this remittance and take due note of the resolutions passed by your Committee at one of their recent meetings, of which you send me a copy.

I also note that Mr. Thos. North Christie has been appointed by your Committee to visit Russia during the current year. I shall have great pleasure to see here this gentleman and will make it my duty to give him every information regarding the work done, the money spent and the steps to be taken in future for the furtherance of Ceylon interests in this country.

When I was the last month in London, I have been pleased to attend a very interesting meeting of the "Ceylon Association," when I gave to the gentlemen present a short illustration of the work I have done during the past months of this year. The progress, I am glad to say are going steadily and the quantity of Ceylon tea imported in Russia is increasing visibly. Many merchants are selling it *pure*, the consumption is now on a much larger scale and the quantity used for blending with China tea is getting rather important.

I also notice that *direct* Export from Ceylon to Russia has—in the six months past—(from 1st January to 30th June 1897) increased of 10,600 lb. over the corresponding six months in 1896.—I am, dear sirs, yours faithfully.

M. ROGIVUE.

## TREE PLANTING IN CEYLON: AUSTRALIAN TREES BY AN AUSTRALIAN FORESTER.

DEAR SIR,—Being on a short visit to your beautiful island and having during that time found my way to "Kandy" and to "Nuwara Eliya," etc., and having observed the nature of the soil and climate, and its accompanying conditions, I was much struck with what I judged to be the fitness of the country for the extension and profitable growth of our Australian Red cedar (*Cedrela Australis*), so it occurred to me that this valuable and very light and easily worked handsome furniture timber might well be made to take the place here of a great deal that is now next to valueless, or only made use of for shade purposes amongst the cacao plantations, etc., in what was originally the jungle forests in and about Kandy, and other kindred places. In Australia this tree, so long and much sought after for its timber, is now becoming very scarce, and is besides more or less subject to the ravages of the ova of a moth which deposits her eggs in the young shoots when as they mature in the grub form, they eat the young tender germinating leaves and eventually work their way down into the pith of the young wood and, in this way, often do considerable damage. In this country I think it is highly probable that it would not have this pest to contend with, and as it is a quick-growing tree, and of large size (up to 20ft. in circumference) it might perhaps be introduced and cultivated to the greatest advantage, more especially on the hill slopes under the partial protection of other trees. That the Australian trees will thrive *well*, *now* you have abundant proof in the thousands of silky oaks (*Grevillea robusta*) to be seen on the tea plantations everywhere between "Kandy" and "Nuwara Eliya," besides eucalypts; also some of our acacias, *A. decurrens*, and *A. melanoxylon*, at the last mentioned place, where I have rarely seen their growth equalled in their native soil and habitat, nor have I seen a more vigorous and promising growth than is to be observed in the other trees mentioned, even in their native Australia, unless I except *E. Globulus* which might do better, but here I would remark that in some places under my observation, unless thinned out at an earlier stage of their growth, some of them are planted a great deal too close together. Of our eucalypts in N. S. W. I would recommend a trial of our Blackbatt, *E. pilularis*, which is a very quick straight-growing tree whose timber is fissile, and lasting when mature.

There is one thing in which I may compliment the tea planters of Ceylon: in the enterprise they have shown in their tree planting; also the administration of Ceylon in their system of Conservation of Forests, both of which have put us to shame in N. S. Wales, where these matters are treated with stoical and ignorant indifference, both by its people and Government.

AUGUSTUS RUDDER.

*N. B.*—I have been a continuous resident in N.-S. Wales for over 60 years, and for 12 years in its Forest Department.—A. R.

*P. S.*—The timber of *Grevillea robusta* in N. S. W. is considered our best for the staves of casks as it is tough, does not warp, nor does it shrink much, nor impart any bad flavour to wine or butter stored in it. Our only regret in respect to it is, that it is now very scarce, indeed while we are now losing some of our best timbers, and fodder plants, other countries, more alive to their importance than ourselves, are getting the benefit of them. In N. S. W. the proportion of forest that has been conserved is little more than 2½ per cent of the whole and even this wretched provision is constantly liable to curtailment under political pressure from outside influences, and very bad Timber Regulations under an uninformed Administration of Forestry.—A. R.

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## TREE-GROWING IN CEYLON.

Abbotsford, Nanuoya, Sept. 30.

DEAR SIR,—There is neither *Eucalyptus pilularis* nor *Cedrela Australis* on Abbotsford; but there are specimens of the former on Carlabeck in the near neighbourhood. It is a magnificent tree and nothing better could be used in forest clearings, but amongst tea it is objectionable, as it is one of the eucalypts which exudes any amount of tarry gum which tea dislikes. *Cedrela Australis*, I presume, is allied to the *Cedrela Toona*, etc., which have been tried extensively here.

The *C. Australis* evidently suffers from insect pests in the same way as the White Toon, and I should therefore say leave it severely alone in its native habitat.—Yours faithfully, F.

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## HOW TO ECONOMISE THE AVAILABLE LABOUR SUPPLY.

SIR,—From afar I venture to give you my ideas on some of these points: but will only touch on such of your questions as I can tackle with full personal knowledge.

To begin with, let me bracket questions 2 and 8. Let your field S. D.'s have a pony each, especially on large estates, and more especially in the lowcountry. It is a long morning from 6 till 11, and after 8 o'clock many a youngster feels slack and limp, especially where he has to cover long distances over rough ground from point to point, not to mention that a pony will save much time otherwise wasted in weary trudging, and will allow considerably more attention to be given to field supervision. I am satisfied that more time *behind the gangs* would result in more work being got out of the coolies; and a man fresh from the saddle would have more energy and could impart more of the same to his coolies, than one pumped out by a steep short-cut; languidly dragging one foot after the other, and only wishing it was time to get back to the bungalow. I have vivid recollections of my S. D. days when I was not allowed to use the road if there was a short-cut; and I know of one man who was told by the doctor that he had injured his heart permanently by "busting it" up *koorka pâthies.* There used to be an idea that a man who rode to his work was lazy. The sooner this is put aside, the better.

4. The cleaner the estate the cheaper the work: and I never met a man who "believed in weeds" but he was short-handed. As soon as such an one has sufficient labour he will unblushingly tel you that his estate has always been clean and that he never did believe in weeds!—and he is invariably stronger on the enormity of a dirty estate than the man who has been habitually clean.

5. Less frequent weeding would certainly end in disaster: and selected weeding is not possible in practice. I have known it tried: but the inevitable tares came up with the wheat, and the last state of that man was worse than the first.

6. Wheat and tares again.

7. Drainage might be much improved by renovation pits between the existing drains. These conserve much soil which is otherwise carried away; and if made big enough, could be filled in with prunings, the prunings, of course, being covered, and fresh pits opened. These cannot be too many nor too big. I prefer them in shape of a trough two feet deep and long enough to cover two trees. They should, of course, be diagonally one below the other, so as to overlap each other over the whole field, thus reducing the loss by wash to a minimum. They are risky on steep lands with heavy rainfall; as an overflow from such pits would cause more damage than bursting drains.

9. Gardens by all means. If they are well kept, you know that your coolies intend to remain. But no extra perquisites. One great cause of the labour trouble is that Ramasamy is too rich already. No Asiatic can stand prosperity. What percentage of coolies had plain rice and chillies brought out to the field twenty years ago? And how many have three meals a day of good curry and rice today? Most appetising is an occasional sniff from their breakfast in the fields. Further perquisites or presents make Ramasamy think himself indispensable, and as soon as that idea gets into his head, he is useless.

10 *Estate boutiques and monthly payments are excellent*—but the present custom of advances and payment of coolies puts the system, with its control of boutique debts, out of the region of practical politics.

WILD MAN OF THE WOODS.

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PARAGUAYAN TEA.—Ina report to the Foreign Office, quoted in the *Board of Trade Journal* H M. Consul at Villa Asuncion states that *Yerba-maté* or Paraguayan tea, is the most valuable article of export from that place. There are two classes sold, but it is only in the manner of preparation that they differ. The kind known as "Mboroviré" is merely dried over a furnace, and then beaten into small pieces with sticks. The "Molda" goes through the same process, but it is afterwards ground in a mill. The export duty on the former was increased in 1895 from 30 c. paper to 10 c. gold, and on the latter from 25 c. paper to 9 c. gold per 10 kilos. The revenue derived from this source in 1895 amounted to 471,668 dols. (£16,845). The *yerba* forests, called *yerbales*, were formerly the property of the State, but most of them have been sold, and are now in the hands of a few capitalists and companies. The Industrial Paraguaya Company, which owns about half the *yerbals* known to exist in the country, exports annually about 400,000 arrobas (4,512, tons). The total quantity of *yerba* exported during the past year is estimated at about 9,024 tons, and the average price per arroba (25 lb.) was 11 dols. 50 c. paper (7s 8d.)—*Journal of the Society of Arts*, Sept. 17.

## "HOW TO ECONOMISE THE AVAILABLE LABOUR SUPPLY ON OUR TEA PLANTATIONS."

*(Letters Continued.)*

No. XLII.—High District.

1. Wire shoots of great advantage. The damage to leaf can be minimised.
2. Aërial tramways.
3 Average estates are too steep; and curves awkward.
4. Not, when well drained beforehand.
5. Not on my own estates.
6. Have not tried. The experiment would be useful.
7. Have no experience of cuscus. Might not the roots prove a nuisance in the soil?
8. ———
9. Time and half for night work in factories. Keep the lines clean and in good repair. They usually have gardens enough. Few care much for them.
10. A rice store and one boutique are good.
11. Liquor shops (having usually very bad liquor) are a curse to the coolies. D. K.

No. XLIII.—Uva.

1. I have worked wire shoots for transporting leaf, and consider them a great labour-saving appliances. If terminals are properly arranged, no damage will be done to leaf.
2. On most estates labour might be economized by construction of light cart roads, and working single bullock carts to take leaf to end of shoots, firewood, &c.
3. Tramways in my opinion can only be profitably utilized in very large concerns. On ordinary estates, traffic would not pay cost.
4. I certainly do not consider weeding has ever been overdone in Ceylon, and weeds when not regularly taken out, become both expensive and troublesome.
5. I certainly would not advise less frequent weeding, as a means of saving labour. In the coffee days it was tried with disastrous results.
6. I have never tried the experiment and would prefer seeing some one else do so.
7. I scarcely think cuscus grass or anything else would have much effect in the retention of the soil, when the rainfall registered in a couple of hours as 7 inches, and this is no uncommon occurrence in many parts of the island.
8. ———
9. Coolies are very fond of their gardens. All the same they are a doubtful advantage. The lazy coolies prefer staying in the lines to coming to work on the chance of being able to steal his neighbour's produce. The working cooly often remains at home to watch his garden produce; and often as not gardens are only nurseries for weeds.
10. No, decidedly not. It would only multiply the coolies' borrowing powers, which are already extensive enough.
11. Not with liquor shops licensed, but illegal sale of arrack is carried on to a great extent in the villages, where produce is taken in barter, both tea and coffee find their way to these dens, and small chance of catching the thieves or getting a conviction when they are caught. J. B.

No. XLIV.—High District.

1 No experience of their working, but I think they might with advantage be used on most estates. They are said to damage tea leaf, but it would get as much damage during long transport in bags on coolies' heads.
2. Small tramways in factories and withering houses save a great deal of labour, and, if more automatic working of machines could be thought out and applied by engineers, tea house labour would be saved and the work of the tea-house would be more satisfactory.
3. Only on estates with a favourable lay of land; not on the majority of upcountry estates.
4. Not hand weeding, but carandi weeding is certainly overdone, and it is very difficult to prevent it.
5. Less frequent weeding would result in a continual increase of weeds, and more expense or labour; a three weekly weeding would in the end take less labour. Mosses, and small ferns, &c. can be left with advantage.
6. No. Digging on the average estate, with the ordinary system of drainage, would probably result in the loss of a great deal of soil.
7. Not very satisfactory. I have seen good results in the way of retaining the soil from planting hedges of tea on the upper banks of roads and drains.
8. By giving tasks as much as possible, and paying extra for extra work done over and above the ordinary task, especially in plucking.
9. Coolies appreciate the privilege of having space given to them for vegetable gardens and of keeping cattle, where there is grazing land. Where land is reserved for gardens round each set of lines, coolies are more likely to be contented.
10. It is always an advantage to have boutiques on or near an estate, and coolies will work more regularly in this case than if they have to go a long distance for supplies, as they are then more likely to want a day off work.
11. Yes; and I find liquor shops and arrack canteens most demoralising to coolies. The fewer liquor shops in a district, the better for all concerned, for there is nothing so damaging to the efficiency of a labour force as the close proximity of a liquor shop. J.

### REVIEW OF LETTERS XXXVI TO XLIV.

The nine letters under notice, share many of the distinguishing features of those which preceded them, especially in variety and vigour; and they cover more space than the batch of letters we last reviewed. "A. F. C.," from the low-country, has avoided the mistake of attempting to find an answer to each question in a word or two; and his deliverance on wire shoots is specially interesting, as his experience, based on the erection and working of several of them, is entirely in their favour. One in six is a reasonable all-round gradient and by no means too steep, though he has set up and worked shoots as flat as one in 15, but these require runners of large diameter to facilitate work. He has found that leaf is not damaged if carefully packed and the loads are not too heavy—say over 56 lb. This is also the experience of "Hantana" from a medium district, who is convinced that they save a lot of labour, that in many cases they pay themselves, and that they might be much more largely used. "W. F. J." from a high district, has no experience of shoots, except for firewood; but he is contemplating an overhead wire tramway for the transport of leaf from several estates to the central factory, and believes this is just the direction in which time and labour might be saved, where both are of importance. "A.V.R." also from a high district, like the two correspondents who follow him, has a blank against wire-tramways; but he is a believer in shoots and finds they do not damage leaf when properly worked at the receiving end. That, too, is the experience of "T.C.H." of the Kandy district, who has used shoots for the last five years in sending down leaf to the factory, with a good buffer of grass at the lower end which prevents any appreciable damage to the leaf. "S." from a Southern district, on the other

hand, has been unable to prevent some damage to leaf and would prefer not to shoot leaf, except where there would be a great saving of labour. We fancy the gradient and the weight of the loads explain this difference of opinion; for we find both "D.K." from a high district and "J.B." from Uva uniting in their testimony in favour of shoots, as of great advantage in saving labour without damage to leaf if the terminals are properly arranged; while "J," also from a high district, though he has not worked shoots, sees how they must save labour, and how the damage to leaf need not be greater than during long transport. He also appreciates small tramways in factories and withering houses; but considers out-door tramways unsuited to the majority of upcountry estates; and that opinion is shared in by all the writers whose letters are under notice, including "A.F.C." who,—although he has laid three miles of a two feet gauge and has practical experience of tramways,—regards them as unsuited to most estates. There is nothing in his view—and most of the letters we have noticed comprise that view—to touch the cart road and bullock bandy for economy and serviceableness, and there is the further advantage of their being thoroughly understood by the native.

On the question of weeds and wash too, "A.F.C." writes with welcome freshness, and without being afraid of differing from other danters. He has no doubt that weeding is overdone; but the difficulty of deciding what special weeds peculiar to each locality should be left, and the impossibility of following the Indian plan of leaving everything to grow and then digging it all in, without the risk of having all the surface soil washed off, have reconciled people to the present system. Moss, as more than one previous writer hinted, has a tendency to sour the soil by excluding light and air; but on Labukella estate our friend cultivated a creeping grass which prevented wash admirably; although he fears his successors may have regarded the experiment as "rot." He prefers guinea-grass to cuscus, as serving for fodder, while protecting the edges of drains. "Hantana" and "W.B.J." do not believe there is over-weeding, though the mamoty and scraper are objected to. Grevilleas are recommended, as their leaves prevent wash, and the wood is useful for fuel; but the growth of a crop to be dug in is an experiment which "Hantana" as well as "J. B." would wish some one else to try!; while "W. B. J." refers to experiments with Scotch thistle which did not succeed, though he fails to see what the benefit would have been if the weeds had been replaced by the thistle! In fact there seems to be a consensus of opinion against digging in on steep lands, and a prejudice against a second crop on land of every description. Cuscus, about which some writers seem doubtful, does not, so far as we know, spread in a way to damage tea, while it can be easily thinned if it shows too great a tendency to spread. Tea hedges certainly strike one as a good idea; but whatever precaution and preventives be adopted against wash, there is nothing so effective as a careful system of drainage at the outset—shallow drains, of gentle gradient, not too far apart and with traps at intervals, for they can catch something more than silt, at any rate during average showers. It is noteworthy that from one planter comes the suggestion of effective supervision as one of the most potent means of saving labour; and from another the regular enforcement of tasks with extra pay for extra work. Frequent absences from the estate, even for such pleasant recreations as most districts provide, and which, in moderation, would be most unreasonable to condemn,—can scarcely help towards effective supervision or the exaction of a good day's work for a day's pay; and if "master" takes it easy, Ramaswamy has too much of human natuie in him not to follow the comfortable example. In this connection "A. F. C." raises the important question of the sufficiency of the cooly's pay, and whether the extravagant advances now in vogue, most of which are irrecoverable, are not an undesirable way of giving the cooly a higher rate than appears in the check roll. The discussion of higher wages is scarcely opportune in the face of dwindling profits; but how can we be sure that a higher rate of wages—even it adopted—would give the quietus to the injurious system of advances? While gardens commend themselves to most employers as a great attraction to coolies, it is gratifying to find that several of our correspondents give prominence to firm, just, yet kind treatment, with an occasional jocular remark, as the best way to attract the cooly to, and make him respect, his durai. The multiplication of boutiques is generally regarded as a mistake, as also would be the absolute prohibition of "a drop," seeing that it would be impossible to enforce such prohibition. It is quite evident that as regards the relations of master and servant, cooly and the durai must be in touch if they are to work to the best advantage of both, and this is just what so many experienced men say the young planters of the present day—with notable exceptions of course—fail to realize, not qualifying in the cooly language as they ought, nor in attention to cooly complaints, quarrels and little wants, even to the extent of an occasional jocative remark!

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*(Letters Continued.)*

### No. XLV.—Kotmale.

1. None.

4-5. *Weeding.*—The existing system of weeding cannot well be beaten if carefully done with the minimum of scraping and moss and soil undisturbed in order to get a cover over the ground. Less frequent weeding would mean vigorous scraping, loss of soil and erelong more expensive weeding. It has already been proved that two-monthly or three-monthly weeding is more costly in labour per acre per annum than monthly weeding.

6. On weedy estates, rows of grass might with advantage be planted above drains, but on clean estates there is very little wash: hence these are unnecessary.

9. *Labour.*—Out of a total force of 764 working coolies and children, I find 175 were born on the estate. Some have never been to India and it has occurred to me that estates would have a better chance of retaining the old coolies and in a great measure stop the constant changing of estates by coolies if all estates were to adopt some system of an annual bonus to both adults and children born and resident on the estate, say at Tivali or Thai Pongal. I have been thinking out a scheme for some time, but have not yet decided upon the best means of doing it. A coat or cloth to each cooly would not amount to much and be money well spent. A. F. S.

### No. XLVI.—Northern District.

1.———

2.———

3.———

4. There is weeding and weeding! Weeding has been vastly overdone by scrapers and mamoties. Hand weeding can scarcely be overdone.

5. With scrapers, weeds cannot be easily "selected." Mosses and hard ferns are not eradicated on my places, unless the ferns become too luxuriant.

I would not advise such experiments unless the land is flat.

6. No, and would not advise it.

7. Yes—in the circumstances No—the cuscus scheme is not practicable on a large scale. The rows would have to be moved every year or so.

8.———

9. No. I always allow gardens up to reasonable limits.

10. No. Prices in these small boutiques are generally so high that a working cooly will never go to them if he can get to a larger village. They are besides admirably adapted to facilitate the cooly's getting into debt, and illicit sale of liquor.

11. No. But there is plenty of illicit selling. I scarcely think anything short of abolition of liquor shops within 25 miles of an estate would stop drinking and even that would only do so partially. The vicinity of villages with toddy trees also must not be overlooked.

The labour difficulty began with altered conditions of superintendence, assisted by the Medical Aid Ordinance, and its remedy is probably to be found in superintendents' hands taken generally. The cooly is pretty much what we have made him or allowed him to become. W.

## No. XLVII.—High District.

1. I have not much practical experience of wire shoots as regards leaf transport, but they must injure it to a certain extent.

2. A question impossible to answer without knowing cost of tramway. But on certain estates it would free a larger proportion of coolies for plucking purposes.

4. Weeding is not overdone in Ceylon. The best form of weeding, if it could be carried out, would be once in three weeks. At any rate in wet weather.

5. This applies to 5 or 6.

7. The present drainage system, I don't think, can be much improved upon.

9. *Coolies*:—A certain amount of ground should be allowed round all lines for gardening purposes Attention should be given to the water supply Coolies greatly appreciate a supply of *pure* water, (which can only be done by spouting from the source) laid on to the lines.

10. A bazaar supported by the estate (at fixed rates as far as possible) is an excellent thing, but coolies would obtain from this all they could afford to pay cash for and would then probably run into debt in the bazaar outside. What in my opinion would be the best check against coolies running into debt in the bazaars would be a law making advances from the estate to the cooly a first claim over any other debts. Chetties rather would not then be so ready to accept Kanganis' promissory notes, which are the ruin of many a labour force. C.

## No. XLVIII.—Mid District.

(1) Yes, certainly. No; on steep gradients shunts could be used to obviate any damage.

(2) In the field, plucking shears; but I do not recommend them. Factories are as a rule, so well equipped now with labour-saving machinery that but little, if any, improvement can be made.

(3) No, but I think that Tavalam bullocks could be more freely used for transport of manure, tea boxes etc.

(4) Yes, most decidedly. Present system seems to me more for appearance than for any advantage derived therefrom.

(5) I should certainly advise a less frequent weeding, say once in six weeks, also selected weeding, taking care to keep the tea trees clear of mosses etc. 6 inches round the stems.

(6) No. Yes.

(7) No. Waterholing might be advantageous. The rows of cuscus grass on a neighbouring estate are certainly deterrents to washing down of soil.

(8) I can suggest nothing further.

(9) Gardens round lines are general. In my opinion as much ground should be given to coolies as is available and can be spared for the purpose.

(10) Yes, but coolies *will* go to the principal bazaars in their neighbourhood to learn the news and to meet friends and relatives from other estates.

(11) The liquorshop in this neighbourhood (which is luckily somewhat distant) gives no trouble, but there is a considerable traffic in illicit toddy.—No, as it would only lead to further illicit sales (and of adulterated liquor.)

"S. E."

## No. XLIX.—High District.

(1) *Wire Shoots.*—These are invaluable when ground is suitable, but gradients in hilly districts are often too steep for effective working and the converse holds true in the lowcountry. Intermediate ridges are the chief obstacle to their general employment.

(2) *Labour-saving Appliances.*—Except sifters and automatic driers, labour-saving appliances are of little use in a factory. A certain staff is required and labour-saving appliances reduce the hours of work rather than the number of men employed.

(3) Not in upcountry districts—there are about 10 miles of roads to 300 acres—at least 3 miles of road (Tram) would be needed to transport say 300 tons of green leaf per annum.

(4) Clean weeding may be overdone, but I do not think a dirty estate would last longer in bearing or give more crop or cost less than a clean one.

(5) Less frequent weeding would not save labour in the long run. Moss and selaginellas are hurtful to tea owing to the damp they engender. A cooly is not a botanist and it would be difficult to get him to discriminate between injurious and beneficial weeds, if the latter exist.

(6) No! I should be willing to try the experiment if seed were available.

(7) A tea hedge above each road and drain seems to me the best conserver of soil; if pruned low, it does not interfere with passage of workers and gives a good crop of leaf.

(8) It is evident that one must have coolies sufficient to pluck the maximum crop of the largest month and to manufacture it. The difficulty is not to save labour, but to find work for it in the slack months when sufficient for high pressure of crop.

(9) Coolies have as a rule more garden ground than they work. The gardening cooly very often does not work and simply squats on the estate occupying line room, keeping others away from the estate. There are exceptions to this rule.

(10) Small boutiques for each estate would keep down opportunities for crimping, but there are objections to them as leading to inferior supplies of certain articles.

(11) Liquor shops could not be too much reduced in number, *provided* that illicit sales were kept down. Quality of liquor should be rigidly seen to. R.

## No. L.—Uva.

(1) Yes, they might be more freely used. They do not damage tea leaf if laid at an easy gradient.

(2) Tramways in factories. Endless wire ropes, where the weight of down load brings an upload.

(3) Certainly wherever the easy gradient of road will admit.

(4) No. Kanganies must have a *quid-pro-quo* if weeding contracts be taken from them. (R100 a cooly!)

(5) If I resort to this, it will be solely due to shortness of labour.

(6) No. I cannot write from any experience of this.

(7) Yes. The closer the drainage, the less soil is carried away.

(8) A contented labor force and good rice.

(9) No. I don't think it is a situation of the cooly's lines has a good deal to do with this question.

(10) I would certainly.

(11) No. I consider them nearly a necessity, though I visit with severity any laborer who forgets himself in this respect.

D.

No. LI.—Medium District.

(1) I consider wire shoots might be more used than at present. They do not damage the leaf. Wire shoots are most useful when they can also be made use of in manuring.

(2) A wire shoot from cattle shed, wire at the far end which can be moved from one part to another of the estate.

(3) I do not think so.

(4) I do not think *hand* weeding could ever be overdone, but I have noticed great damage being done by the use of mamoties and carandies.

(5) No. Not if hand weeding is done.

(6) No. I think not.

(7) The present system of drainage is satisfactory, and I am of opinion that nothing can be done to improve on it that would pay for the extra outlay.

(8) By paying cash for anything over a certain number of pounds. But the coolies require to be looked after and always paid by the Manager himself. There is no doubt an estate can be worked with two-thirds of the coolies if extra cash is paid and it is also cheaper.

(9) Yes, any cooly that wishes a garden can generally have one. A cooly allowed to look after all the coolies' cattle when out at grass.

(10) No.

(11) No. Great trouble is caused by the unlawful sale of fermented toddy by villagers.

G. C.

No. LII.—Medium District.

(1) Planters as a rule do not let slip opportunities for adopting labour-saving appliances. Wire shoots do not necessarily damage leaf.

(2) *Wire* tramways are the most paying appliances I know.

(3) The tramways you speak of are, I presume, small railways. They are not to be recommended as an estate appliance, but are possible as a district appliance.

(4) Never! Our contract system is our *grandest* labour-saving appliance. Indian men envy and wonder.

(5) See answer to No. 4.

(6) It would add to our labour troubles; though as a manurial agent, it would do good. On the score of labour, I deem the experiment inadvisable.

(7) Our drainage system has been often carried too far, removing too much moisture and thus checking the flush in dry weather. The rows of cuscus grass would only be a very partial remedy for wash.

(8) The only important direction in which labour might be saved is by the abandoning of unprofitable fields.

(9) Nothing but fairness and justice. "Suaviter in modo, fortiter in re." The velvet glove *covering* the iron hand.

(10) Each estate should have its own boutique run by the estate or a kangani; and all kaddie-keepers and chetties should be deprived of the power to give credit to our coolies by an ordinance.

(11) Rather! No liquor shops if possible, and no liquor on credit. Government *must* step in and protect our coolies as soldiers are protected; and we must be prepared to issue supplies ourselves to our coolies. In Australia, I believe, publicans can only recover a certain limit from all bushmen. So a law should be passed fixing say R12 per annum as the maximum legal credit or debt that can be recovered from a coolie.

"1897."

No. LIII.—High District.

(1) Wire shoots are certainly a great saving where roads are steep for transport and factories distant. Leaf I have never found damaged.

(2) Leaf carts for transport where roads are available. Machine or hand-packers in factories if cheaper would probably be more used.

(3) There is too much horse traffic on most estate roads to allow of tramways being used. I doubt the saving even if practicable.

(4) The average estate weeding (i.e. *scraping*) is overdone. Land weeded carefully by hand or small stick is always clean and consequently take less labour. Scraping and scrapers are generally winked at.

(5) Moss on banks of drains and roads should be carefully left untouched. It keeps the soil up and does no harm.

(6)——

(7) Holes cut in alternate rows are being tried on some estates to catch wash and soil, and are proving effective.

(8) A question most of us would like to know. Energy and a European S.D. means more work from the coolies and a smaller force required.

(9) Gardens are generally allowed, but very few contain anything worth growing. On estates where cattle and goats, etc., are allowed, the coolies seem content.

(10) The less bazaars the better. Most estate coolies deal near their rice depôts where they go on Sundays.

(11) Liquor shops do not themselves directly do harm, but the retailing of arrack in the lines means several coolies absent from work..

H. H.

## REVIEW OF LETTERS NOS. XLV TO LIII.

The nine letters under notice are as full of interest and variety as their predecessors. "A.F.S." and "W.," from a northern district are silent on wire-shoots and tramways; while "C," from a high district, who confesses he has not much practical experience of shoots in the transport of leaf, inclines to the view that they must injure leaf to some extent. As one ounce of fact is to be preferred to a ton of theory, "C." will be pleased to find considerably more than an ounce in the letters we have already reviewed, as also in many which follow his own welcome, if cautious, contribution. Thus "S.E." of a mid-district is emphatically in favour of shoots, and says that on steep gradients "shunts obviate any damage." "R.," from a high district, regards them as invaluable when ground is suitable, though some places upcountry may be too steep, just as in the lowcountry the fall may be too flat for effective working; but the chief obstacle to their more general employment is the intervention of ridges. "D.," from Uva, thinks shoots might be more freely used, as they do not damage leaf if they are laid at an easy gradient. "G.C.", from a medium district, endorses this view; and so does "1897," who, however, considers wire tramways the most paying appliances in his experience; while "H.H." goes further, and declares he has never found leaf damaged by the use of shoots, which he holds to be a great saving of labour where the roads are steep and factories distant. And yet, he does not disdain leaf carts, where roads are available. Ground tramways continue to find little favour with our correspondents, owing to their initial cost—though for district, as distinguished from estate, purposes, they would be welcomed in many directions. Among the other labour-saving appliances which are recommended, are machine or hand-packers in factories, if their cost could be lessened; wire-shoots from cattle-sheds to be shifted to suitable points at the other end; tramways in factories; endless wire ropes, where the weight of a down-load brings an up-load; the planters' old friend the tavalam bullock; while one writer regards the contract system—the envy and wonder, he says, of India—as the "grandest labour-saving appliance" of the country, and the most economical means of weeding; and yet another thinks that cash for extra work beyond the task, would enable an

estate to dispense with one-third of its labour force. This, surely, is a matter that needs investigation; for although the dictum may support the view of more than one old planter, that the average of work at the present day is far lower than it used to be, it would indicate a way out of the difficulty of enforcing a full task, and facilitate the recovery of advances. The cooly who earns his extras will have less objection to deductions on account of advances than the man who is demoralized into idleness by the weight of advances he can never hope to liquidate.

On the question of Weeding, there is the same conservative love of the existing system which earlier letters disclosed, qualified by protests against the excessive use of karandi and mamoti. "A. F. S." thinks "the present system cannot be beaten;" but he would leave moss and soil undisturbed as far as practicable, and he would grow grass above drains on weedy estates, as there is very little wash on clean estates! "W" admonishes us that there is weeding and weeding, and that there has been overdoing only where scrapers and mamoties are in use. Hand-weeding cannot be overdone; and he leaves mosses and hard ferns alone, unless where the latter becomes too luxuriant. "C." is emphatic that weeding is not overdone in Ceylon, and he holds that the present system of drainage cannot be much improved on. "R." does not think a dirty estate would last longer than a clean one, and he condemns mosses and selaginellas as hurtful to tea owing to the damp they engender, while, with the unbotanical cooly, selected weeding cannot be entertained. "D." is as emphatic as he is brief against any interference with the present system; for without weeding contracts, the kangani will expect R100 per cooly. So with "G. C.," "1897" and "H. H." who more or less reflect the opinions of the writers we have above-quoted. The only exception is "S. E." who is most decidedly of opinion that weeding is overdone, and that the present system seems to aim more at appearance than any real advantage from an agricultural point of view. He is in favour of less frequent weeding—say once in six weeks—and would enforce selected weeding, taking care to keep mosses away within six inches of the stem.

There is general satisfaction with the present system of drainage, with slight modifications, suggested, we fancy, by local circumstances. Cuscus has not many friends as a stop-wash, but it is not altogether shunned by those who have tried it, or have watched its effect on adjoining places. Though gardens are generally recognised as an attraction to coolies, and planters, where they can, allow them suitable plots, and also liberty to keep cattle and goats, we find very decided testimony from experienced and influential quarters that, what the cooly chiefly wants is fair-play—firmness combined with kindness, and a real interest in his poor soul and body. That was the secret of the *durais* of old; but, somehow, the modern master is, with commendable exceptions, either too busy or too keen on sport to cultivate the acquaintance of his labour force, and to make his men understand that he really cares for their welfare and is willing to listen to their grievances and remedy them, so far as he may. We should be glad to find the experience of "A.F.S." more common. Out of a total force of 764 working coolies and children, 175 or nearly one-fourth, were born on the estate, and a goodly number have never been to India! Similar results might, he thinks, be obtained on other estates by occasional presents and bonuses. The suggestions are worth considering and trying. Boutiques and taverns call forth much diversity of opinion. Some favour estate boutiques as tying the cooly down to the spot; others regard it impossible to check the vagrancy of coolies in search of a bargain whereby even a cent may be saved on curry-stuffs, while an estate boutique is generally a handy receiver of stolen produce. Some would make Ramasami a teetotaller; others see the impracticability of enforcing total abstinence, however desirable, and welcome licensed taverns, as greatly to be preferred to the illicit sale of arrack.

———

*(Letters Continued.)*

### No. LIV.—Mid-District.

1. I consider wire shoots on estates, where suitable sites are to be found, a very great saving in transport of leaf. Where practicable, more should be used. They do well also for transport of fuel.

2. I fail to see why all final firing and packing should not be done in Colombo, all teas being sent down in special chests made for the purpose in good stout paper, so saving transport of all lead, nails, hoop-iron, etc. up to the estate.

3. I think not; besides, most estates require all their fuel for factory.

4. Nothing like clean weeding from the first. When tea covers the ground well and when weeding is done for a rupee per acre per mensem, I think, seeing our pluckers have to go over the ground every eight days, they can, at the higher altitudes, be made to keep down all weeds—when the kanganies would be well paid if they got 50 cents per acre *pro rata* on number of pluckers employed during the month, thus saving 50 cents per acre.

5. No, I would weed as above. Mosses and small ferns should be left as they do no harm, and all help to keep up soil and prevent wash; indeed with this in view, tea should be planted closer I should say two plants in each hole, say 18 inches apart. Land planted in this way will terrace itself, no matter how steep.

6. No, beyond growing grevilleas for fuel which do no real harm to the tea. I would do nothing in this line. The mulching of the ground by fall of leaves of this tree does a lot of good particularly in thin tea where there is a large percentage of vacancies.

7. I don't think we can improve our present system of draining. Drain as close as possible; but, try to have few leading drains, other than natural ravines, as possible as they always cut up terribly with our N.E. plumps. I don't believe in soil traps, the best soil is always washed away, leaving nothing but sand in the trap which is useless.

8. The best means of saving labour is to get a good S.D. or conductor and make him carry the pocket checkroll regularly, thereby keeping a lot of cents off the cost of the pound of tea. Allow a fair rate for each work and don't let it be exceeded.

9. Cooly gardens should always be encouraged; they are a sure sign of contentment. Few coolies, however, care to have them owing to the thieving that goes on.

10. Yes, every estate should have its own bazaar. They help to keep the coolies from wandering and from being crimped and save a lot of time lost by coolies, who should be at work, having to go for their supplies in some cases long distances.

11. Yes; the very curse of the low-caste natives. Government Agents should restrict them as much as possible in planting and all other districts.

OLD PLANTER.

———

### No. LV.—High-District.

1. I have had no experience in wire shoots, but have seen them working. They save labour, and might be used more than at present. Can't say whether they damage leaf or not.

2. Can't think of any except those generally known.

3. Tramways would be too costly, including their own cost and the sacrifice of a number of tea bushes.
4. I prefer the present system of monthly weeding to any other.
5. With the present system of manuring, mosses, etc., etc. would scarcely get time to grow.
6. Answered in No. 4.
7. I think close draining on the present system the best. Can't give an opinion, on the effect of rows of cuscus grass planted above drains, having never seen them, or ever heard of the system being carried out before.
8. ———
9. There are gardens around all my lines, but very little grown in them except weeds. The only thing coolies seem to care about now is getting into debt. It leaves them no time for gardening.
10. I think the system would be a good one, but it is very difficult to get boutique-keepers to start in isolated places. They like clustering together in certain central spots.
11. I am not troubled much with drunkenness amongst coolies except at Teevali and Pongal.

T.

### No. LVI.—Lowcountry.

1. Have only used shoots for firewood. They might be used a good deal in this district for short distances.
2. Narrow cart-roads for half-carts might save a good deal of labour on large estates.
3. I fancy cost and upkeep would be too large.
4. Yes, but the *cheapest* way is to keep the land clear of weeds by monthly weeding and—
5. I do not think there would be saving of soil or labour by less frequent weeding. Selected weeding might do good.
6. No.
7. I have done a little terracing above roads, but it would be too expensive to do much except in very stony parts.
8. Have found I require a less number of coolies for plucking since I started paying Tamils by the lb. instead of by the day.
9. Have always seen small plots given to coolies round the lines.
10. No, each boutique would sell illicit arrack.
11. No, but arrack is obtainable by the coolies on the edge of the estate, and I have reason to believe is likewise sold in the lines. Nothing will do any good in this direction unless we can get the co-operation of the renters.

C. H.

### No. LVII.—Medium District.

1. Yes, they save a great deal of labour, and the damage done to leaves is very slight.
2. ———
3. No experience.
4. Yes, it is often overdone, but occasional weeding is very expensive in Ceylon where weeds grow all the year round. In India from October to March no weeds grow.
5. No.
6. No.
7. The litter from grevilleas saves wash very much and keeps down weeds.
8. ———
9. Coolies work far less when they have large gardens; they are very fond of living on their gardens and cattle. I am strongly against large gardens and cattle.
10. No.
11. Yes, they are a great curse, and spoil the good effect of cash plucking.

F. J. H.

### No. LVIII.—High District.

1. Too constantly working. Yes, unless much care is exercised they *do* injure the leaf.
2. ———
3. Tramways owing to formation not practicable except on very flat estates.
4. *Weeding* not overdone, *scraping* has been.
5. No. Remove "karandies."
6. No, no.
7. Closer draining and more frequent cleansing of drains very desirable; where land is very steep cuscus might be tried on upper side.
8. ?
9. Give more accommodation. Build lines and as a rule they will be occupied. Allow cattle and goats and provide accommodation for them.
10. Caddies, as a rule, are quite near enough and sufficient.
11. No.

B.

### No. LIX.—High District.

1. Wire shoots are probably applicable much more freely than at present on estates. They damage tea leaf a little.
2. ———
3. No experience.
4. Weeding may be overdone in Ceylon, but kanganies will not stay on estates unless they have weeding contracts given them.
5. Selected weeding might be advisable, but no moss or lichen should be allowed to accumulate on the stems of the bushes.
6. No experience.
7. The present system of draining is, as a rule satisfactory.
8. None to suggest.
9. I believe it always pays to give ground for gardens to coolies Coolies with good gardens are those who think twice before leaving.
10. Yes, certainly.
11. Liquor shops might be reduced with advantage. Arrack is, however, smuggled into the lines on every estate, as is well-known.

O. C.

### No. LX.—High District.

1. I have had experience with both shoots and wire tramways on Hunasgiriya. Shoots will do well for bringing firewood near the factory, provided there is wood growing or to be procured on the estate from any point where the gradient is sufficient. I should think a wire shoot would damage and bruise tea leaf; but a *wire tramway* with endless wires at a suitable gradient, and wheels with grooves on each wheel, also a brake to regulate the speed, would be correct for transporting tea from higher elevations. Every estate has not the lay of land suitable for a wire tramway of the kind I write of. I have used wire tramways for artificial and bulk manures frequently and with success, especially in bringing back bags or manure sacks.
2. Carts could be used more frequently.
3. Yes; very possibly.
4. Weeding.—I have no reason to believe weeding has been overdone in Ceylon. I know that Indian planters have remarked this; but cooly labour being expensive in Ceylon the general system of weeding contracts given to kanganies helps to keep a labour force, and I fear that any change of system would check a labour force. Selected weeding might be tried, but the Tamil being very conservative I do not think it will answer; as it is, the clean weeding, done in the coffee days, has not the attention given now to tea on account of daily plucking.
5. I cannot say; but a great deal of moss is left while weeding on many estates.
6. No, I have not; but I should like to see it tried.
7. I would suggest where *practical* a large pit or dam be constructed at the bottom of the estate and all drains directed to this pit. It has been done before with good results: possibly several pits should be dug, but many estates have not the lay of land for one pit.
8. A better Labour Ordinance; the one of 1865 was more for coffee; but tea being a daily product the present Ordinance is unsuitable.
9. During my experience all or most coolies have gardens; if not given they are generally taken and enclosed.

10. Yes, until two or three estates have their own; also bring rice for coolies on to the estate.

11. Not now. No, I do not think liquor-shops should be abolished, as coolies, if they want liquor, will procure it some way or other; but I would reduce them in number in the planting districts.

J. N.

Note.—I consider the first thing necessary in planting is a new Labour Ordinance suitable for the tea product, Agents in India to help the cheated cooly, and longer terms of agreements with coolies and kanganies. Possibly bring a "Register Ordinance" in force, to prevent continual running away of coolies, and I would even suggest a legal visitor or Magistrate for coolies on estates to settle all their family and caste quarrels, also to act as a civil commissioner to decide all irregularities with respect to debts, as I know personally the present labour force is disorganized by kanganies and heads of families; possibly a visit once in four months would suffice.

### No. LXI.—High District.

1. Yes; but not for leaf. No reason for damage unless the shoot is too steep when the check cord could be used.

2. They have been pretty well utilized in all well-going factories.

3. Only on exceptional estates.

4. Clean estates, weeded under a rupee, should be kept clean, with drains in proper order. Dirty estates, far better left, save taking out coarse weeds and the surface stirred over with a mamotie once a year to prevent a too compact surface forming.

6. No; have no experience of the process.

7. Drains are often traced too steep; one in 25 should not be exceeded. Cuscus grass will rob three feet above it and grow too rank.

8. A good kangany, good tools, and task work, where practicable.

9. They usually cry for gardens, when there are none; when plenty space for them, gardens are usually quite neglected.

10. A bazaar under the head kangany is useful, but coolies like to go where they please.

11. Liquor shops are bad, and unnecessary; but here I never see a drunk cooly. I have plenty of labour and no advances out.

THIRTY-THREE-YEARS-AT-IT.

### No. LXII.—Medium District.

1. Yes! they can be used more freely than they are at present, especially on steep estates of large acreage. It does to some extent damage tea leaf, dependent more or less on the length and gradient of the shoot.

2. Usual machinery in factory.

3. Not in every instance, but it may be profitably used, where great distances have to be covered and where a dip exists between the starting point, and that to which goods, &c., are sent.

4. Yes; where the hoe was incessantly used.

5. No; but would suggest, that the hoe and karandi be dispensed with, and the kootchie used instead, and every weed being pulled up as far as practicable. This would not loosen the surface soil, and consequently there would be less wash.

6. ———

7. Planting tea in hedges, both above and below roads and drains, will to a very great extent catch up the soil and prevent wash. There is no method yet found out, that can be practicably applied towards preventing all the soil from being washed away.

8. A rough estimate before a work is started, as to its cost, and the work done thoroughly (allowing in cost for good and substantial work) will save a great deal of trouble and expense and be cheapest in the end.

9. Leave the cooly to look after his comforts and he will always be contented; but if you attempt to administer towards his comforts, you will breed discontent and he will never be happy. The cooly is happiest when he is the most ignorant; if attempts are made to over-educate him, he will no longer be a cooly, for, when thus, he will not care to do the work of a cooly, but will look upon it as beneath his dignity to do such work. The best thing is to give him his wants and let him alone.

10. Yes.

11. No. If arrack shops were abolished in the planting districts, estates would get on very much more satisfactorily than at present.

W. S.

## PLANTING NOTES.

"Will Coffee-growing Pay?" asks Mr. D. Buchanan, Manager, State Nursery, Mackay. He answers:—

I would advise all those who are in doubt about the matter to visit the State Nursery and see for themselves the crops on the trees here. Mr. Dansy, manager of the Mackay Coffee Company's estate, says he has not seen a better crop in Ceylon. I feel sure that a good future is in store for the coffee-growing industry; and it is just those farmers who have 30, 50, or 100 acres of cane who can go in for coffee successfully, as they have money coming in to tide them over the three years during which they have to wait for a crop.

Double Rice.—In the *Proceedings of the Asiatic Society of Bengal* for April 1896, Dr. D. Prain describes and figures what is known in India as Double Rice. In all cases the phenomenon was found to be due to an increase in the number of ovaries, the other parts of the flower being invariably of the normal number. In the gynæceum of over 150 flowers examined not one was found with fewer than four ovaries, all apparently perfect; the usual number being five. A few flowers were found to have six, and one or two had seven ovaries. When five, six, or seven ovaries were present, sometimes only three, but usually four or five appeared to be perfect. The ovaries may be one-, two-, or three-styled. Usually only two ovaries develop into grain, sometimes three, and their shape is modified accordingly.—*Kew Bulletin.*

Rubber-Tree Lands.—The National Congress of Bolivia have issued decrees declaring all rubber trees, or other wild trees or plants, available for industrial purposes, which may grow in forests or lands not legally held by individuals or duly authorised Companies, the property of the Government. In doing so, the Congress, however, promise important concessions to natives or others exploring the public forests in search of rubber trees. Concessions are to be granted by "estradas," or groups of one hundred and fifty trees, and actual proprietorship will accrue to those who reside in the community for a period of five years. Unless actually authorised by the Legislative Chambers of Bolivia, no individual can hold more than five hundred estradas, and no Company more than one thousand. The expenses attending the grants (15 Bolivian dollars) are payable by grantees and may be extended over fifteen years. Discoverers of rubber trees will have the preference in the granting of concessions. Certain rules are made for the protection of labourers employed on the lands included in these concessions, but they do not seem unduly stringent, though they throw a great deal of responsibility on the grantee. There has been recently formed in London, the Columbian India Rubber Exploration Company (Limited) with a capital of $1,500,000, it being the outgrowth of an agreement made on April 2. 1897, between the Columbian Syndicate, Limited, and Mr. R. Alena as Trustee for the new Company. The object of the Company is to explore, obtain concessions and carry out the business of India-rubber tree growers and merchants.

PARA RUBBER, COCOA AND LIBERIAN, says a Ceylon correspondent from Kandy to *Planting Opinion*:—"People are talking a lot about this para rubber, and I hear of some being planted. We have a hundred plants or so doing very well. I also hear of Liberian coffee being cut out as a failure. The cocoa ground here looks good enough for anything and carries a fair crop, but parts are being planted up in tea, which does not look like a paying concern."

TEA MACHINERY.—We ought to have directed the attention of planting readers to the criticism of Tea-preparing Machines and especially of Driers, by "Engineer" in a letter which we reproduced from the "Indian Planters' Gazette." We should like to know what experienced Factory Managers in Ceylon have to say on the criticism therein offered. "Engineer" is severe on Assam withering houses and says: —"A properly equipped withering house should turn out the leaf at a given hour should it be wet or dry."

PROGRESS AND AGRICULTURE IN ZANZIBAR.—We have received copies of a new Zanzibar journal "The Shamba," to which we wish all success. It quotes the "Tropical Agriculturist" about iron ploughs introduced into Madras and adds:—

We in Zanzibar have not yet reached the wooden plough stage, which is against us. There are now some iron ploughs and other iron implements on their way from England, which if successfully tried might help us to dispense with a period of probation with the wooden article; though a wooden plough would be better than none at all. We feel sure that the question of agricultural implements should be taken up by Arab planters.

It is interesting to learn about rainfall in Zanzibar:—

The total rainfall for May was 12·21 in 9·04 in. of which fell on five consecutive days, May 19-23, when the Mwera Bridge was washed away. Though more than a month's dry weather has elapsed, the small lakes of water which were then formed, have not yet disappeared, and mosquitoes are the consequence. The average rainfall for April and May for the 5 years 1880-4 was 10·24, and 10·12 in. respectively, according to the reports published by Sir John Kirk, making 20·36 in. for the two *mashika* months. This year it was 15·12 in. for April, which with the 12·21 for May, makes 27·33 in for the *mashika*, so we have had a wet time of it altogether.

The average annual fall should be given.

The clove crop is the most important:—

Reports have come in which show show that the clove crop is not so promising in the north as in the middle of the island. The prospects in the neighbourhood of Kokotoni, and to the north of that, are not so good as they were last year.

CLOVES.—The stock of cloves in the London market on May 8 was 83,257 bales, the imports to date being 12,223. This shows that 71,036 bales of last year's crop have not yet been disposed of. The corresponding figures for each year since 1893 are:—

| | Stocks in hand | Imported to date (May 8.) |
|---|---|---|
| | Bales. | Bales. |
| 1893 | 45,804 | 25,656 |
| 1894 | 53,535 | 23,141 |
| 1895 | 78,507 | 26,461 |
| 1896 | 79,479 | 8,199 |
| 1897 | 83,259 | 12,223 |

Here is a useful reference:—

As we shall frequently have occasion to refer to an acre of land and as many of our readers may not be familiar with its measurement, we give below a few figures. An acre of land measures:—

| | | | |
|---|---|---|---|
| 220 yards long | and | 22 yards | broad |
| 110 ,, | ,, | 44 ,, | ,, |
| 88 ,, | ,, | 55 ,, | ,, |
| 69½ ,, | ,, | 69½ ,, | ,, |

A yard is a good long stride: few men step a yard in their natural stride. There are two yards in a pima: one mile long and one mile broad is 640 acres.

CEYLON BAMBOOS TO GERMAN EAST AFRICA.—The N.-D L. ss. "Sachsen" took away from Colombo, a well-packed box containing several shoots of bamboos of various varieties to Aden, to be transhipped thence to German East Africa. The plants are despatched from the Peradeniya Botanical Gardens. We believe they are sent at the request of a German gentleman as an experimental measure to introduce the bamboos to African soil. For a new country the bamboos should prove not only an ornamental plant, but one of great use for many purposes. Several kinds of the wild *bata* and cane are included in the outgoing shipment and as our readers are aware, one of this kind is profitably used in the manufacture of tea-plucking baskets.

COCO-PALMS AND LOCUSTS.—Mudalyar Dassanayake brought to us recently part of a leaf of a coconut palm nearly all eaten away and a bottle of large bright-coloured creatures, pronounced at once to be huge grasshoppers or locusts—though the natives say they never saw such before. In Hapitigam Korale, the Mudaliyar said, palm branches were literally covered and riddled by these enemies. Mr. Staniforth Green kindly reports as follows:—

"Locusts—These usually appear in large numbers. They are of a most destructive species."

The visitation is a most unusual one, and we trust the locusts may as suddenly disappear as they have come. Have they been seen in other districts?

MR. NATHAN SHARPE, an interview with the Inventor of the "Simplex" tea machinery is reported in *Indan Planters' Gazette* of July 17th, accompanied by a portrait. The information given is very much what we had before in Ceylon; but we may quote the following:—

Mr. Sharpe hopes to get some oxidisers at work on the Darjeeling gardens later on, and to lessen the time now taken up by the process of fermentation in those parts, and at the same time improve the standard of quality. Mr. Sharpe has received orders from the three largest estates in Ceylon for his machines, *viz.*, Mr. Lipton's Lemastotte Factory, Dambatenne Group, the Diyagama estate and the Bandarpolla estate, and has promises of a good amount of orders for next season from Indian estates. The machines are all manufactured by the well known engineering firm, Messrs. Richard Moreland & Son, Aldersgate, London.

THE COFFEE OUTLOOK.—In the coffee market the influence of that bogey, the Brazil crop, is paramount. Speculation in "futures," which is supposed to rule the coffee market in the main, is still of a sorry character, and the downward tendency in prices goes on unchecked, says the *Grocer*. "Sagging," to use a familiar term, has been the order of the day with operators in coffee for several months past, and the decline in quotations for inferior and common qualities since the begining of the year has been a very serious matter for holders. The prodigiousness of the Brazil crops for the 1896-97 season—which we have before pointed out—has been the sole cause of the prevailing depression, and until their full extent is known or realised, and the bulk of the coffee has been delivered, no solid improvement can be expected. With the 30th ult. the old season ended, and recent cables give the total receipts of Rio and Santos at the Brazilian ports, since July 1, 1896, as 8,680,000 bags, in comparison with 5,489,000 bags in 1895-96, also 6,699,000 bags in 1894-95, and 4,307,000 bags in 1893-94. Here we have a crop representing about twice the amount grown and gathered four years ago, and likewise materially heavier than what was then—in 1891-92—regarded as the largest yield ever recorded, viz., 7,386,000 bags, consisting of Rio and Santos in nearly equal proportions. Now, however, the excess is composed chiefly of Santos, which description has yielded over 5,000,000 bags of coffee, as contrasted with 3,100,000 bags in the previous season, and only 1,750,000 bags.

## PLANTING AND TRADE IN THE PERAK STATE IN 1896.

We have to acknowledge receipt of the Annual Report on the State of Perak for last year by Mr. W. H. Treacher, C.M.G., British Resident. It is a full and valuable statement of progress under the various heads of administrations with very copious statistical returns in appendices. At the outset we note there has been a falling-off in General Revenue last year, by less than 2 per cent on that of 1895; but quite 6 per cent below the Estimate. This is attributed to the low price of tin and a decreased output. The total trade too shows a falling-off as follows:—

| | | |
|---|---|---|
| Value of Imports | .. | $ 8,713,940 |
| do. Exports | .. | 14,289,680 |
| Total value of Trade, | 1896 | 23,003,620 |
| do. do. | 1895 | 25,177,597 |
| Decrease, 1896 | .. | 2,173,977 |

We are told a good deal about Public Works and Surveys trigonometrical and otherwise, and great activity is manifest in respect of Railways. At present there are open the Larut line 17 miles and the Kinta Valley line 51 miles. Then as to further progress we quote as follows:—

Extension to Penang.—In the absence of any port worthy of the name, Penang (Kuala Prai) is the natural Port for the northern portion of this State, and the extension thither of the Larut line, at a small cost per mile, by arrangement with the Colonial Government, through flourishing agricultural country, would be of benefit both to Perak and Penang, and in all probability yield a fair return on capital expended. The distance is about 50 miles, of which 24 miles would be in colonial territory.

Construction.—During the year the extension of 13 miles from the terminus at Ipoh, via Tanjong Rambutan, to Chemor, was opened to traffic. Sanction was obtained for the extension of the line from Chemor to Kuala Kangasar in June 1896, a distance of 22 miles. Work was at once commenced, and by the end of the year about six miles of formation were completed. It is hoped that the extension will be opened to Sungei Siput, 12 miles from Kuala Kangsar by the end of June of the present year. A sum has been provided in the estimate to complete the line into Kuala Kangsar, by the close of 1897, with the exception of the superstructure of the bridge over the Perak river, which will probably cost $130,000 and should be put in hand at once.

Surveys.—The survey of 16 miles from Chemor to the Perak river was completed, including selection of site for the river crossing. The survey thence to Taiping is being rapidly performed, and the hope is indulged in that the old trace may be somewhat improved upon and the anticipated cost of the tunnel at the pass be reduced.

Trial surveys for proposed extension from Tapah Road to Tanjong Malim, on the Selangor borders. The Resident Engineer for Railways reports 58½ miles of trace cut, surveyed and levelled, seven miles cut and surveyed, 47 miles cut only. As far as can be at present ascertained the line will be easy and the length under 50 miles, but for nearly the entire distance it will be through heavy forest, and some considerable deviations will be required to avoid heavy works.

Towards the close of the year a commencement was made with the survey from Ulu Sa'petang to Parit Buntar (Kuala Prai extension.)

Further Extensions.—Extension to Kuala Prai, 50 miles.

Joining up the 20 miles between Taiping and Kuala Kangsar. This will be essential to complement the proposed extension to Kuala Prai and to form a continuous line of railway from Kuala Prai, the northern port, to Teluk Adson, our southern port. It is, in any case, manifestly desirable to connect the Larut and the Kinta Valley Lines by the construction of this proposed '20 miles of line, which has now been in contemplation for some years.

Tapah Road to Tanjong Malim, *i.e.*, to the Selangor boundary. Distance about 50 miles. I am not in a position to express an opinion as to this extension. The district has not yet been opened up by roads, and I have seen no reliable report as to the capabilities of the country through which the line would pass. There are, doubless, tin deposits, but the probability is that the railway will, to keep down cost, run even further away from the cross valleys which contain the deposits than does the cart-road now under construction. Again the richer deposits, it is anticipated, will be found towards the Selangor boundary, and the natural route to the sea would be the Selanger-Kuala Kubu line. The soil of many parts of the district is reported suitable for European plantations.

The time has arrived for a forward policy in railway extension, and for connecting the existing lines. In the past we, in Perak, have constructed our short pieces of railway, not out of current surplus revenue alone, but with the assistance of the surpluses accumulated by the wisdom of Sir Hugh Low, during the period when the question of Native States railways was in its infancy. We have no longer these accumulated surpluses to fall back upon, and if we are to extend it must be with the assistance of a loan. To employ any small amount of surplus revenue that can annually be provided in carrying out slight extensions, which can bring in no return until the completion of the scheme of which they form part, is hardly a judicious policy.

But to us in Ceylon the most interesting information is contained in the following:—

The total acreage of European coffee estates, Liberian with one exception, opened, or being opened, in the State by the end of 1896, is given as 35,242 acres (approximate). On the whole the reports from these estates are encouraging. Six thousand four hundred and five acres of new land for European coffee estates were given out during 1896.

Batang Padang is the district in which Malays have made most progress with the cultivation of coffee, and the District Magistrate reports:—"A very large amount of coffee has been newly planted by the Malays and three large blocks of land for the same purpose have been applied for by Europeans. I hope their example will lead to others coming into the district, which ought to be one of the finest in the State for coffee planting." In other districts Malays and Chinese are increasingly interesting themselves in this culture.

Pepper.—The improved price of this article has caused the natives to pay some attention to their few and neglected pepper plantations but, except when high prices rule, this culture does not appear to attract our natives. One European planter has found that he can obtain very profitable prices for his white pepper.

Coconuts.—Some of the European planters are now alive to the solid advantages to be derived from coconut plantations and are planting to a considerable extent. The soil and climate appear to be admirably suited to the requirements of this palm, in the inland as well as in the coast districts. Natives in different parts own not inconsiderable plantations and efforts will be made to encourage them to extend. In the Matang district the Chinese proprietor of a tapioca estate of 692 acres has planted 300 acres with coconuts and is extending his plantation.

Ramie.—The subject of ramie cultivation, as the Resident-General is aware, has not escaped the attention of the Perak Government, and thanks are due to Mr. L. Wray, the Curator, for the trouble he has undertaken in investigating points connected with the subject. The results of his investigations are not yet ready in a shape to be placed before the public. The plant has been grown for ages by the natives, in very small quantities, for their own use, and our rainfall and climate generally are said to be especially favourable to its growth.

Banana Flour.—A new industry, the preparation of banana flour, has been inaugurated on a trial scale by one of the European coffee planters. Good quotations have been given in England for small samples, and hopes are entertained of the success of the experiment.

Mr. F. D. Osborne presented samples of some particularly well-cured Liberian coffee, grown near Gopeng, in the Kinta District, as to which the Curator writes, "this coffee has been fetching a better price in Singapore than any other produced in the Straits. The high value placed on it has been due to its colour and not to any superiority of the bean." He continues, "the Liberian coffee grown on the hill at Waterloo Estate apparently has a finer bean than any from the plains. Some trees planted by Mr. Cecil Wray in 1880-81 are well-grown, vigorous bushes, in full bearing, while trees of four years old, planted by Sir Graeme Elphinstone, on the same estate, on land cleared twelve years previously, compare most favourably with bushes of the same age on the low lands, planted on newly cleared forest land."

Exports for the years 1895 and 1896.

| Article. | | Total 1895. | Total 1896. |
|---|---|---|---|
| *Agricultural Produce.* | | $ | |
| Betelnuts | .. | 9,019 | 23,806 |
| Tamarind | .. | — | 60 |
| Cotton | .. | — | 32 |
| Fruits | .. | — | 9,162 |
| Patchouli | .. | — | 1,831 |
| Tapioca | .. | — | 60 |
| Coconuts | .. | — | 3,354 |
| Copra | .. | — | 5,001 |
| Indigo | .. | 13,377 | — |
| Coffee | .. | 80,759 | 80,112 |
| Padi | .. | 32,443 | 267,136 |
| Sugar, Brown | .. | 593,329 | 546,196 |
| ,, White | .. | 205,263 | 188,357 |
| ,, Cane and Tops | | 2,187 | 27 |
| Tobacco | .. | — | — |
| Pepper | .. | 14,836 | 14,032 |

## SALT IN AGRICULTURE.

A planting correspondent writes:—"You have placed agriculturists of all classes under a great obligation by the handy compilation you have just issued from the *Observer* Press. One great obstacle to effective and persistent agitation on any matter, is the difficulty of bringing the information bearing on it, and scattered in diverse ephemeral publications, into a focus. In respect of the value of salt for agricultural purposes, of the restrictions placed on its sale for other than culinary purposes through the Government monopoly, and of the manner in which similar obstructions have been overcome in Germany, admittedly one of the most progressive and scientific countries in the world, we have all the information now collected in a handy form in the little booklet, which is cheap at 50 cents. Its publication should not only strengthen the hands of those who are agitating for a relaxation of the stringency of the conditions under which salt is now sold, but it should also stimulate inquiry on the part of planters of all products, so that they might test the utility of salt in the cultivation of different products. The value of salt for stock is beyond all question, and is admitted and recognised in all countries."

## RUBBER CULTIVATION IN CEYLON.

We give below the papers embodied in the Sessional Paper compiled in answer to Mr. Chamberlain's brief despatch giving cover to a letter from Kew. Neither Mr. Broun and his able assistant, Mr. F. Lewis, nor Mr. Willis add much to our practical knowledge on the subject, although Mr. Willis's estimate of 750 acres being now planted with rubber in Ceylon is a safe one. Our latest Directory compilation gave 634 acres and we should hope the returns we are just about to call for, in order to make up a fresh Directory estimate, will show an increase of at least fifty per cent in area. The experiments in "tapping" promised by Mr. Willis will be looked for with much interest.

The Right Hon. J. Chamberlain, M.P., to Governor the Right Hon. Sir J. West Ridgeway, K.C.B., K.C.S.I.

Downing street, April 23, 1897.

Sir,—I have the honour to enclose, for such action as you may think fit to take, a copy of a letter from the Director of the Royal Botanic Gardens, Kew, calling attention to a report on the cultivation of rubber-producing trees in Mexico, and suggesting that the subject should be entertained by your Government I have, &c., J. CHAMBERLAIN

The Director, Royal Gardens, Kew, to the Under Secretary of State, Colonial Office.

Royal Gardens, Kew, April 20, 1897.

Sir,—You have no doubt observed that the employment of indiarubber in the industrial arts has of late enormously increased. This substance is obtained in the tropical and warmer parts of the world from trees occurring spontaneously, and which have to no appreciable extent at present been subjected to cultivation. Apprehensions have therefore been expressed that the supply at no distant date may be very much restricted.

2. On this point without accurate information it is difficult to give a positive opinion, but it must be admitted to be extremely probable. It is therefore not surprising that projects have been formed to grow plantations of rubber-producing trees artificially. I am anxious to draw the attention of the Secretary of State to the account of an enterprise of this kind given in the accompanying report by Her Majesty's Minister in Mexico.

3. Twenty years ago the Secretary of State for India in Council invoked the aid of this establishment to introduce the species yielding indiarubber in South America into India. The operation was successfully accomplished at considerable cost. Three species were established in Ceylon, where they have since produced seed, which is available for distribution. As far as I am aware, no practical result has followed. Yet it cannot be doubted that there must be many spots in our Eastern Colonial Possessions where rubber cultivation might be prosecuted successfully. I venture to think that the matter is one to which the attention of the Governments of Ceylon and of the Straits Settlements might be properly drawn. Probably if a memorandum were issued by the botanical officers of these colonies pointing out the culture, conditions suitable to each species and the source from which seed could be obtained, planters would engage in the enterprise.

4. In recent years a tree (*Kickxia africana*) has been discovered in West Africa which yields a rubber of excellent quality, and this has become the basis of a trade of great magnitude. Seeds of this tree have been sent from Kew to the Botanical Departments of Ceylon and of the Straits Settlements.—I am, &c., W. T. Thiselton-Dyer.

The Conservator of Forests to the Hon. the Colonial Secretary.

Office of the Conservator of Forests, Colombo, May 20th, 1897.

Sir,—With reference to your letter No. 195 of 18th instant I have the honour to state that the pamphlet enclosed therein deals with the Castilloa rubber.

2. The late Dr. Trimen recommended the plantation, not of Castilloa, but of Para rubber plantations, and in consequence the Forest Department plantations have been made with the latter species,

3. I have already requested the Assistant Conservator to make an estimate of plantations on a larger scale than has hitherto been done, and as soon as it is submitted I shall forward it with my remarks.

4. I can however state here that if a large plantation is taken in hand it will be necessary to have a special superintendent in charge of the plantatiou for the Assistant Conservator, with his numerous duties requiring his presence in different parts of two Provinces, will be unable to devote sufficient time to a plantation which requires constant supervision.—I am, &c., A. F. BROUN, Conservator of Forests.

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The Conservator of Forests to the Hon. the Colonial Secretary.

Office of the Conservator of Forests, Colombo, May 25, 1897.

Sir,—In continuation of my letter No. 202 of 20th instant I have the honour to annex copy of a report on the subject by the Assistant Conservator of Forests, Western Province.

2. Mr. Lewis proposes to plant 300 acres per annum, and submits an estimate for the first year amounting to R10,202, or R34 per acre. Against this expenditure he shows an estimate of revenue from the sale of timber, firewood, &c., amounting to R4.200. The net expenditure would therefore be R6,002, or R20 per acre for the first year. To this amount would have to be added the expenditure in the second, third, and fourth years on weeding and supplying, which I expect would amount to R12, R8, and R5 per acre, respectively.

3. To my mind, if such a place can be selected I would much rather keep the plantations in one block than open a number of different plantations at various points. Such a multitude of plantations would not only increase the cost of fencing and watching, and the cost on a larger number of cooly lines, but it would do away with the advantage of having a special superintendent always on the spot.

4. If Government wishes the work to be taken in hand, I shall early next month inspect the place near Pelenda where the Assistant Conservator proposes to start work. It will also be necessary to issue instructions to the Director of the Botanic Gardens to reserve all the seed from the trees at Henaratgoda for our plantations.

5. Finally, I beg to point out to Government that the expenditure on these plantations lessens the chance of a surplus for the Department, and that if it intended that the Forest Department should show an increasing net revenue, the starting of these plantations should be put off.—I am, &c., A. F. Broun, Conservator of Forests.

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The Assistant Conservator of Forests, Western and Sabaragamuwa Provinces, to the Conservator of Forests.

Colombo Kachcheri, 20th May, 1897.

RUBBER CULTIVATION, PASDUN KORALE AND KUKULU KORALE.

Sir,—With reference to our conversation at Avisawella on the 12th instant, regarding the further addition to the area of land under rubber cultivation, I have the honour to state that I think it ispossible that at Pelenda in the Pasdun korale, and in the delta formed by the Pelan-ganga, Kukulu-ganga, and Maguru-ganga streams, that the total extent might be brought up to say 3,000 acres.

2. I may remark here, however, that the question of area is not so difficult as the selection of land of a suitable degree of flatness situation, soil, and elevation : for, while it is perfectly possible to find an even larger extent, experience shows that it is undesirable to plant steep hill sides or swampy lands, or lands in which the soil has a high percentage of sand in its composition, with this product.

3. Under these circumstances it is extremely difficult to find a continuous piece of land with all suitable conditions, and therefore I would respectfully suggest that selected areas be first fixed upon, and if their success will justify it they could in many cases be connected by opening the intermediate areas.

4. I am of opinion that in this way a most profitable block of 150 acres could be obtained in the owita lands in the Kukulu korale; where there are 850 acres of this sort of land, but I think it would be unwise to select any below flood level, and so I restrict the proposed extent there to 150 acres. I have a further reason for suggesting this land in particular, as it is both flat and fertile and might be specially worked as a centre for raising seed, for which it is reasonable to anticipate a very large demand as rubber becomes known as a permanent industry; and judging by results of areas set apart in tea for seed bearing, it is not unreasonable to anticipate a very large revenue from this source alone.

5. I may moreover point out that local labour in the Kukulu korale is not in such demand as in other places, where tea estates absorb all available hands for plucking, &c., and therefore be easily obtained by us.

6. I would venture to suggest that 300 acres of rubber per year might be opened, and that operations might begin at once this year, by selection and survey of suitable blocks, and preparatory extraction of all timber that could be first disposed of; and if this is done under European supervision I anticipate that the return by sale of timber and firewood would more than pay the salary of the officer in charge, thus securing the services of one who would be able to devote his entire attention to the proper management of the plantations at practically no cost to the estate. I submit that constant supervision is essential to the proper management of such a plantation that I propose, to increase by 300 acres yearly, and for that purpose I have estimated for a European Assistant to be under my orders.

7. Annexed will be found an estimate for opening 300 acres at once, to be planted early in 1898 with plants to be first grown in a nursery, for which purpose all the seed at Henaratgoda should at once be secured; and I may add that I have, in anticipation, communicated with the Director of the Botanic Gardens to know what quantity can be obtained.

8. Finally, I would beg to be informed with as little delay as possible if I may make arrangements for the selection of 300 acres of land, and if the estimate may receive sanction.—I am, &c.,

Frederick Lewis,
Assistant Conservator of Forests.

ESTIMATE OF COST OF OPENING AND PLANTING 300 ACRES OF FOREST LAND WITH RUBBER : PASDUN KORALE.

| | R |
|---|---|
| Felling and clearing 300 acres of forest at R12 per acre .. .. .. | 3,600 |
| Lining 300 acres 10 ft. by 10 ft. at R2 per acre .. .. .. | 600 |
| Holing 300 acres at 75 holes per cooly, at 40 cts. = 130,680 ÷ 75 by 40 .. .. | 697 |
| Filling and planting and carrying plants from nursery to holes, 300 per cooly, at 40 cts. = 130,680 ÷ 300 by 40 .. | 175 |
| Draining : 300 ft. of drains per acre at 1 ct. per ft. run ... .. .. | 900 |
| Lines for coolies : one shed of 10 rooms of 12 ft. by 10 ft., mud walls and battocalla roof, at R30 per room .. .. | 300 |
| Roads for inspection : 2 miles at R80 per mile .. .. .. | 160 |
| Bungalow for Assistant : improvements to present building at Midellana plantation | 75 |
| Plant nursery, including watering of seed beds .. .. .. .. | 150 |
| Weeding (assuming the opening of the land to be in July 1897), at R1 per acre, for six months = 300 by 6 .. .. | 1,800 |
| Cost of surveying lines round plantation, say .. .. .. .. | 75 |
| Contingencies, such as special work, bridges over streams, or supplying vacancies, &c. .. .. .. | 250 |
| Total actual outlay .. | 8,782 |

SPECIAL EXPENDITURE.

| | R. c. | R. c. |
|---|---|---|
| Salary of Assistant, for one year | 1,000 0 | |
| Cooly to carry letters and orders | 120 0 | |
| Tools (cost of supply) .. | 300 0 | |
| | | 1,420 0 |
| | | 10,202 0 |

ESTIMATED RETURN OFF 300 ACRES OF FOREST TO BE PLANTED WITH RUBBER.

| | R. c. |
|---|---|
| 600 trees sold standing at R2 per tree | 1,200 0 |
| Value of firewood and "ritti" after deducting cost of working: R10 per acre .. .. .. .. | 3,000 0 |
| Total to credit of first year's work .. | 4,200 0 |

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The Assistant Conservator of Forests, Western and Sabaragamuwa Provinces, to the Conservator Forests.

Colombo Kachcheri, 9th June, 1897.

SIR,—In acknowledging receipt of the Hon. the Colonial Secretary's letter to you No. 211, and herewith returned, I have the honour to report that in 1890 a small plot of 15 acres was selected at a place called Edangoda, in the Kuruwiti korale in Sabaragamuwa, and planted with Para rubber. The land was selected close to the Kalu-ganga, and at certain periods of the year it was subject to floods. As the late Dr. Trimen was of opinion that as similar land in its native habitat was best suited for this species of rubber, I laid out my plantation in such a situation as would best correspond with these conditions.

2. It was found, however, that these periodical inundations were harmful, and that plants below flood level were destroyed, notwithstanding much attention having been paid to the supplying of vacancies. By this loss about one-fourth of the Edangoda plantation was destroyed, but of the remainder above high water mark I cannot speak too highly. The trees are in robust health, and form an unbroken cover of trees of some 20 feet in height and from 15 to 20 inches in girth at four feet from the ground. Some 275 trees are this year it fruit at the Edangoda plantation, and I anticipan getting a crop of 30,000 seeds that will be available for use during the present year.

3 In 1891 the Edangoda plantation was extended by one acre, and at a place called Yattipowa, six miles from Edangoda, a second plantation of 16 acres was planted, and in 1892 a further addition of 21 acres more, while as an experiment in chena soil 5 acres of chena land at Edangoda were planted, thus bringing the total area in rubber to, say, 58 acres.

4. The Yattipowa plantation is, on the whole, very successful, the only exception to its general regularity of growth being found upon a ridge where the soil is inferior and the wind appears to check the growth. This is only a very small piece and is quite compensated for by the satisfactory growth of all the rest of the plantation.

5. I am not so well pleased with the experiment of planting chena land, as it has shown a thin and weedy result in trees, but the general conclusion I have drawn from the ezperience gained is that flooded lands, wind-swept lands, sandy soils, and wide apart planting are equally unfavourable to the successful cultivation of Para rubber.

6. I am not in a position to give any information as to yield of the trees, as it has been deemed inexpedient to attempt to tap any of them, but for my own information I selected a solitary tree and obtained from it, from a single wound, a "tear" of pure rubber about 4 feet long and one-third of an inch wide, that when dried appeared to be of excellent quality. The oldest trees being only seven years old, I have not attempted to experiment further, but I hope to be allowed to conduct a few tapping operations in order to test the yield per tree.—I am, &c., FREDERICK LEWIS, Assistant Conservator of Forests.

NOTE.—I wish to add that the foregoing distinctly applies to the Sabaragamuwa Province and that 27 acres have been planted in 1896 in the Western Province and not as yet added to the area in rubber.

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No. 5.

The Conservator of Forests to the Hon. the Colonial Secretary.

Office of the Conservator of Forests, Colombo, July 5, 1897

SIR,—With reference to your letter No. 243 of 26th ultimo, I have the honour to inform you that on the 3rd instant the Director of the Royal Botanic Gardens and I had a conference on the subject.

2. The demand for Para rubber seed is now so enormous that Mr. Willis says if all could be supplied 100 square miles could be fully planted up. The supply from the Royal Botanic Gardens can only satisfy a very small portion of the demand, and even some private sellers have booked all their crops, charging R20 per 1,000 seeds. The Director therefore thinks, and I agree with him, that the publication of a notice offering seed to the public on payment would lead to a great deal of disappointment.

3. He proposes, as soon as he has completed a series of experiments regarding yield of trees of different sizes and ages, &c., to publish a bulletin in which will be included the results of our xeperience as regards soil and locality.

4. I have lately visited the most recent rubber plantation in the Pasdun korale and was disappointed to find that some of the young plants had suffered from some extraordinary floods, and that as compared with the plantations at Edangoda and Yattipowa, Theinitial growth of the young plants is very slow. the sand, which enters largely into the composition of the soil, does not seem to favour vigorous growth.

5. A further area of 75 acres has been cleared this year and will be planted up. They will yield further data as to the suitability of the Pasdun korael forests for rubber.

6. There is little doubt that the rubber plantations now made, will, if successful, pay handsomely. At present from the sale of seed alone R200 per acre could be obtained. I beg therefore for orders as to whether the Forest Department is to satisfy itself for the present with the plantations now existing and being planted up in the Western Province and Sabaragamuwa, or whether we are to make further extensions in Para rubber plantations.—I am, &c., A. F. BROUN, Conservator of Forests.

Report of the Director, Royal Botanic Gardens, on Rubber Cultivation in Ceylon.

Royal Botanic Gardens, Peradeniya, July 28, 1897.

The subject is one of great importance at present owing to the enormous increase of late years in the demand for rubber caused by the growth of the cycling trade and other industries in which rubber is consumed. That the price of raw rubber has not increased very greatly is chiefly due to the discovery in West Africa of a new rubber-yielding tree, *Kickxia Africana*. It seems likely that in a few years' time the reckless destruction of wild trees will cause the price to rise and that rubber-planting will thus become a profitable industry.

The trees yielding rubber are many, but most of them being large jungle climbers are unsuited for cultivation. The chief kinds likely to be useful in cultivation are Ceara rubber (*Manihot Glaziovii*), Panama rubber (*Castilloa elastica*), Para rubber (*Hevea brasiliensis*), and African or Lagos rubber (*Kickxia Africana*).

3. The cultivation of Ceara rubber was taken up in Ceylon about 12 or 14 years ago with some energy, but the returns were found unsatisfactory, though the plant grew very well indeed, and now there are but few trees remaining. Of Panama

rubber there is but little in Ceylon, and seed is only obtainable in extremely small quantities. The new Lagos rubber has only been introduced in the last two years, and the proper mode of cultivation and most suitable soil have yet to be discovered. The only rubber of importance at the moment is the Para kind, and the rest of this report refers only to it.

4. Para rubber was introduced into Ceylon in 1876, when the young plants obtained from Brazil at the expense of the Indian Government were planted in the Henaratgoda Garden. These are now very fine trees with an average height of 60 ft. and average girth (at 6 ft. above ground) of 4 ft., and from their seed other plantations have been made in the Botanic Garden and also by the Forest Department. A large number of seeds have been sold to private planters since 1886. The tree produces only a few seeds, the seeds are large and only retain their vitality for a very short time, and thus it is difficult to obtain seed from or send seed to distant countries. The crop produced by the trees (about 450) in the Botanic Garden is now about 75,000 seeds a year.

5. It is very difficult to obtain exact information, but I estimate the number of trees on private estates in Ceylon to be between 200,000 and 250,000, of various ages from one to ten years. This number represents an area of about 750 acres.

6. The present year has seen a sudden increase in the demand for seed. Hitherto the crop produced in the Botanic Garden has sufficed for almost all demands, but the applications for seed in 1897 have been numerous, and I could easily sell 30 or 40 times as much seed as is obtained from the trees in the gardens. The trees belonging to the Forest Department are only expected to yield 30,000 seeds this year, an insignificant quantity when compared with the demand.

7. The practice of this Department at present is to book seeds for delivery when ripe, in quantities of not more than 3,000 for one person, in the order in which applications are received. The price asked is R5 per 1,000. A much larger price could now be obtained: private planters are obtaining R20 per 1,000 seeds this year.

8. The present system of supplying seed is open to the serious objection that as 3,000 seeds are only enough to plant four or five acres, a planter really wishing to take up the cultivation on a large scale cannot do so within a reasonable number of years. It is desirable that greater encouragement should be given to planters to engage in this cultivation on a considerable scale, and that one man should be able to get as many as 40,000 or more seeds in one year This would take nearly all the crop and would expose the Government to accusations of favouritism, which might be avoided if the seed were sold in large quantities by auction or by invitation of competing tenders. This method would also probably increase the revenue derived from the sale of these seeds. An undertaking should be required from purchasers to the effect that the plants shall receive proper attention and cultivation on areas of land devoted to the one crop only.

9. The area of land suitable for this cultivation is not very large. The plant for complete success requires fairly flat land at about sea level, with good soil, not subject to frequent floods and to heavy winds, and with a uniform wet climate. Only in parts of the low-lying south-western region of Ceylon are these conditions found. On the other hand, the cultivation of rubber need not interfere with that of coconuts, as it does not do well in sandy soil or near the sea, and it should thus form an additional cultivation in the Colony rather than replace any of those already existing by using up the land occupied by them.

10. Opinions are at present much divided upon the question whether this cultivation will pay. The wild sources of rubber are at present far from exhausted, but they are becoming every year more and more difficult of access, and the cost of transport increases the price of the rubber.

11. The answer to this question really rests upon the amount of rubber that may be expected to be yielded by the trees when at a suitable age for tapping (say about ten years old). The accounts given by those who have observed the harvesting in Brazil vary greatly: many mention extraordinary amounts, but neglected the fact that such excessive tapping usually causes the death of the trees. Almost the only reliable observations are those made in the Henaratgoda Gardens. The late Dr. Trimen tapped one of the original (1876) trees every other year from 1888 to 1896. The result showed that from tenth year onwards a yield of about $1\frac{1}{2}$ lb. per tree per year might be obtained. These trees being planted 30 feet apart the yield per acre would therefore be about 75 lb. of dry rubber a year. This is not sufficient to pay well. It would, however, be absurd to draw definite conclusions from experiments on one tree only. I have therefore commenced an extensive series of experiments in tapping, &c., upon a plantation of 11-year-old trees at Henaratgoda. These experiments are now in progress, and their results will be published from time to time. At present I can only mention this one fact, that the average yield so far of an 11-year-old tree is about 6 ounces a year, the trees being 12 feet apart. This represents an annual yield of 112 lb. per acre, which should pay fairly well. It is probable that the trees will be found to yield more than this without injury, but as yet I do not feel justfied in making any definite statement upon this point. The price of good Para rubber in London is now from 2s. 6d. to 3s. 6d. a pound, so that a yield of 112 lb. represents a value in London of about £15 or £16. Considering the small labour cost of rubber, this should be enough to yield a good return upon the outlay.

My recommendations upon the question of rubber cultivation in Ceylon at the present time are as follows:—

(*a*) There being such a demand for seed by private individuals, I should recommend that the seed produced in the Botanic Gardens be sold as heretofore to such individuals, but in larger quantities, either by auction or by competing tenders.

(*b*) That the seed produced in the current year by the trees in the Government plantations under charge of the Forest Department should be used in planting the land which I understand to be already available for purposes of extension of those plantations, and that it be subsequently decided whether the seed of 1898 and following years be sold to the public or used in further extension of the Government plantations.

(*c*) That no further public attention be drawn to the question until after the seeding time for this year is past, when a bulletin should be issued from this Department dealing with the whole question of cultivation, yield, cost, &c.

(*d*) That in the course of the next year or two experiments in tapping on a large scale should be made upon the trees in the Government plantations, so as to ascertain, more accurately than can be done with the few trees in the Botanic Gardens, the yield of a plantation, the cost of collection and transport, and the price obtainable for the product.

John C. Willis, Director.

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## RUBBER PLANTATIONS IN SUMATRA.

Numerous India-rubber trees are growing on the east coast of Sumatra in a wild state, and the natives have collected large quantities of rubber, to the great damage of the rubber-trees, which have become debilitated and in some cases extinct. Within the past few years wealthy Holland companies have created rubber plantations and in the Kassan district a not unimportant market in Sumatra rubber may be expected in the near future. An idea may be had of the remunerativeness of such plantations when it is guaranteed by the directors of the companies that 100,000 rubber trees will clear annually, above all expenses, from 500,000 to 600,000 marks. The editor of the *Gummi-Zeitung*, in which we find this note, expresses very grave doubts of such figures being realized.—*India Rubber World.*

## PLANTING UP OF SHIFTING SANDS NEAR DRESDEN IN SAXONY,

### BY A. M. REUTHER, INDIAN FORESTER.

A considerable area situated within the Dresden Forest Circle has since many years been leased by the Military Department with the object of providing parade-grounds for the Cavalry and Infantry Regiments stationed there. In 1867 it was decided to extend the parade grounds, for which purpose a further area of 100 hectares was included in the lease; and in order to obviate payment of compensation, the Military Department allowed the tree-stumps to be extracted, and the litter to be removed, from this area after the forest on it had been clear felled.

The surface-configuration of this area is undulating and the soil consists mostly of pure sand, containing here and there an admixture of clay up to 18 or 19 per cent. Very soon after the complete exposure of the soil, the sandy surface began to grow unstable, and already in 1870 the shifting sand, moved by the wind, covered not only the adjacent Cavalry parade-ground but also blocked the more distant "Königsbrücker" Chaussee to such an extent as to interrupt all traffic on it. In the next few years the evil assumed such large proportions that it was found absolutely necessary to reafforest the area with the least possible delay.

Operations were commenced in 1874 by covering the whole area with a network of wattled fencing. Strong stakes, 7 to 9 cm. in diameter, were driven into the ground 60 cm. apart, in rows 20 m. apart running south to north, and interwoven with branches of Scotch Pine, the wattled fencing thus formed being 80 cm. high. At right angles to these lines of fencing similar fences were made, about 50 m. apart, and 60 cm. high. Towards the west, where the general surface-elevation is higher and exposed mounds and ridges exist, the fences were placed closer together than on the more sheltered east side so that the average area of each rectangle enclosed by the fences was about 1 rood on the west, and about 2 roods on the east side. The shifting of the sand was thus greatly reduced, and restricted within the enclosures; and already in 1875 it became possible to begin planting. In that year birch and alder were planted in rows along the fences (on the sheltered side), the planting holes being filled with good soil brought from a distance—and in the following year planting up of the interior of each rectangle was begun with Scotch Pine plants 1 to 2 years old, which were put out in squares with the aid of Buttlar's planting tool, 8,000 plants being used per hectare, and each plant supplied with a handful of good humus soil. The compost was prepared in autumn and left lying in heaps during the winter, and conveyed to the site of the plantation just before the planting season in spring.

Results.—The results are quite satisfactory in so far as the ground is now fully stocked, and the surface-soil completely consolidated. But owing to the dryness and poverty of the soil, the growth of the plants is in many places very miserable, many of the Scotch Pines being only 1 metre high though already 15 to 18 years old. The average height is, however, about 5 m., and for the most part the plants have closed overhead. The entire area has been most carefully protected; cattle have been strictly excluded, and grass cutting disallowed, and all unauthorised persons have been prohibited from walking across it. These precautions were absolutely necessary to prevent disturbance of the unstable surface-soil, and to give the plants a chance of establishing themselves.

The Cost of the cultural operations was 44·40 mk. per hectare. The wattled fencing was constructed by a local battalion of Pioneers, and therefore involved no direct outlay; had the work been done by paid labourers, the cost would have been about 0·20 mk. (2½d) per running metre of fencing.

## SALT IN AGRICULTURE.

Mr. W. R. Tringham sends us a couple of small pamphlets published by the "Salt Union Co.", on the manifold uses of their staple. Mr. Tringham says:—

The pamphlet "Agricultural uses of Salt" contains valuable information, for instance read General Observations p. 15.

We quote as follows:—

General Observations.

1. Salt should not, as a rule, be applied with the seed. A little salt is sometimes mixed with carrot seed, an exception to the above rule.

2. It is not advisable to apply salt to very cold, wet clay land. Salt nevertheless assists in the disintegration of clays, if applied before ploughing.

3. One of the principal reasons given by scientific authorities for the application of salt more or less to all soils is based upon the fact that Chloride of Sodium, like other soluble Salts, is constantly being carried off the land into the rivers and seas. If the soil is to be kept fertile, this unavoidable loss must be replaced. Bearing in mind the abovementioned fact, it will be seen that those who think the land near sea coasts does not require salt are in error, as the small amount of salt carried a short distance by sea breezes bears no comparison with the quantity carried away.

4. As a guide to those who wish to make experiments, we may say that a fair average quantity is two ounces of Salt per square yard. A rough calculation is one handful to each square yard.

6. Two cwt. of Salt to 1 cwt. of nitrate of soda, 1 cwt. Salt to 2 cwt. lime, equal quantities of Salt with basic slag, guano, and superphosphates, are usual proportions. Kainit generally contains about one-third common salt and in a report of recent experiments at Reading it is stated that "An equivalent amount of Salt to that contained in the Kainit dressing, has been equally effective."

The use of Salt for Agricultural purposes is by no means recent, as is evidenced by the fact that the Romans and Chinese used it as a fertiliser for centuries before the Christian era. Why its use has been so much neglected and undervalued in the nineteenth century is a mystery to many scientific men.

A provider of plant food. An absorbent. A purifier and cleanser. A destroyer of weeds and insects. Salt improves grass lands and renovates old pastures. Successful experiments with salt in the cultivation of grain crops. In the cultivation of flax Salt has proved to be very useful and necessary. Turnips, mangolds, and beetroot. Salt for gardens and orchards. Salt as a potato manure. Potatoes, cabbage, carrots. Save the ammonia by salting manure heaps.

Salt and Nightsoil.—Where nightsoil or house refuse is used as manure, it should always be mixed with Salt, which destroys any organic life therein, and by chemical action makes the manure more valuable.

And from the other pamphlet:—

Gardens.—Salt is useful to Gardeners in many respects, and when used with judgment its effects are often surprising. Light sandy soils require more salt than heavy loams and clays. For gardens infested with wireworms a good dressing of salt in autumn will effectually disperse this plague. Potato disease may often be prevented by mixing salt with the manure, or by salting the soil a week or two before planting. For celery a thin layer down the centre of the trench between the plants keeps them moist during dry weather and improves the growth. For onion beds a littled sprinkled between the rows, not touching the bulbs, is of advantage. It is most essential to give asparagus beds a liberal top dressing in early spring, followed by a lighter application later on. Seakale beds should also be dressed with salt. Salt is also beneficial to fruit trees, especially Peach, Cherry and Apple. These remarks also apply to flowers, as many practical gardeners recommend salt for the Stock, Hyacinth, Amaryllis, Iris, Anemone, Colchicum, Narcissus, and Ranunculus, &c. As a

rule the best method of application is to use very weak solutions of salt and water. A little salt in the artificial compost used for potting flowering plants, is found to enhance the bloom and brilliancy of the flower.

Salting Manure Heaps.—Horsekeepers and gardeners will find salt most useful for their manure heaps in destroying vermin and in preventing too rapid fermentation and the consequent escape of ammonia.

Weeds.—To destroy weeds in pavements and garden walks, make a strong brine with salt and boiling watter. Apply with a watering can. A moderate quantity of salt stimulates the growth of all vegetation. It is therefore a mistake to suppose that a sprinkling of salt will exterminate weeds.

## PLANTING NOTES.

Tea in the Caucasus.—Reports from Odessa states that the new tea plantations at Chakia, in the Osurgentski Government, on the Caucasus, have given most excellent results, and encouraged their proprietors to engage a number of Chinese experts to instruct the natives in all the intricacies of tea growing. The last tea crop yielded ¼lb. of tea for every bush planted, or 1,500 lb. from an acre having 6,000 tea plants on it. The whole available area for tea growing is 20,000 acres, therefore the total yield could with ease be brought up to nearly 30,000,000 lb. which represents more than half of the annual consumption of the tea imported into Russia. This news is not gratifying to those who expect an expansion of the Ceylon tea trade with Russia, but it is no doubt unduly sanguine in its estimate of future results.

Canal Silt as Manure,—We learn from an Indian paper that Dr. J. W. Leather has been making some interesting investigations into the value of canal silt as a fertiliser, and he comes to the conclusion that the amount of silt and its contents of nitrogen and phosphoric acid are very small during the cold weather, and quite insufficient to replace the plant food taken from the soil by a crop of wheat. On the other hand, the silt carried on to the land during the monsoon period contains very material quantities of these plant foods. They are probably fully sufficient to replenish the amounts of plant food which are taken from the land by the rice crop. According to Dr. Leather's analyses, some 32lb. of nitrogen and 42 lb. of phosphoric acid were supplied per acre by canal silt in the latter period, as against 8 lb. and 20 lb. respectively in the cold weather.

"The Queensland Agricultural Journal."—Issued by direction of the Hon. A. J. Thynne M.L.C., Secretary for Agriculture Volume I. Part 2. August, 1897. Contents:—Agriculture—The Agricultural Possibilities of Western Queensland, H. A. Tardent; Maize-growing on Scrub Lands, A. J. Boyd; The Velvet Bean; Dairying—Choosing and Breeding Dairy Cattle, John Mahon; On the Developement of a Dairy Breed from our Native Cattle, P. R. Gordon; The Tick Pest; The Orchard—Fruit Culture in Queensland, Albert H. Benson; Co-operation in Marketing Fruit; Grape Fruit; Show Awards; Entomology—Scale Insects, Coccidæ, Hy. Tryon; Apiculture—Bee-keeping for Extracted Honey—Part II., H. Stephens; A Tropical Industry—India-rubber (Caoutchouc)—Part II., E. Cowley; The Divi Divi Tree, E. Cowley; Chemistry—Composition of Foods, J. C. Brünnich; The Farmers' Conference at the Gatton Agricultural College; The Fruit growers' Conference; Opening of the Agricultural College; Exhibits of the Department of Agriculture at the International Exhibition, Brisbane, 1897; General Notes; The Markets; Farm and Garden Notes for August; Field and Garden Notes for Tropical Queensland; Orchard Notes for August; Oranges.

Ceylon Tea in America.—We direct attention to the interesting extracts from Mr. Wm. Mackenzie's letter on this subject. Clearly a good hold has been got on the attention of both the Press and large tea houses in the United States, and this is mainly due to the interest fostered among the consumers. A very good answer to those who go on exalting "Chinas" and "Japans" and depreciate machine-made teas, should be to enquire how, as patriotic Americans, they regard the tea produced by Dr. Shepard in South Carolina. They cannot deny its purity and value, and it will be found, on examination, to be of the same type as our Ceylon teas, though scarcely so delicate as our medium and especially high-grown. Our Tea Commissioner may well take courage and go on with his advertising, whether in verse or prose, in the United States as well as Canada.

Coffee in British Guiana.—Mr. Thos. Garnett writes in *Timehri* to correct the prevalent notion that coffee is being grown there for the first time:—

We are solemnly told—quite as a discovery—that the cultivation of Coffee on the already mentioned and misnamed *coast lands* is "perfectly practicable." Now, considering that Coffee was the principal product of this Colony before sugar was ever started here, and as one only has to refer to the annals of the Colony to see how largely it was grown in the No. 1 Canal and other suitable *river* districts, this information is indeed wonderful, and is about on a par with the strange dissertations that have been appearing lately in the local press on the subject of Coffee growing in this Colony. Why my father remembers that little property called "Java," on Canal No. 1—which at the time was entirely in Creole ("Arabian") Coffee—changing hands with only a handful of slaves, for £30,000! I myself have been growing both Liberian and Creole Coffee in the Canal District for a considerable number of years, and as Messrs. Lewis & Peatt's report on my sample appears to have led some people to think that this is the first time Liberian coffee grown here has been sent to England, I may mention that I have been shipping the same to London off and on now for some years, and my shipments have been very ably disposed of, at prices more satisfactory than those now quoted by Messrs. Lewis & Peatt.

The Abolition of the Tea Duty, if effected in Belgium, will have important results says the *Pioneer*—to the advantage of planters in India and Ceylon. It will encourage the use of tea as a beverage, and experience shows that the taste once acquired is retained and spreads by example. As yet Russia is the only country in Continental Europe where tea drinking is general, but the custom is becoming common in Fance, where, however, as elsewhere tea is heavily taxed. More important than any fillip to consumption in Belgium resulting from the abolition of the duty, will be the effect of that step in strengthening the cause of those who are agitating for the abolition or reduction of the duty in England, and it is not likely that the Chancellor of the Exchequer will be able to resist their demand if he gets many more big surpluses. The advocates of "a free breakfast-table," like the income-tax payers, have been mortified of late years by seeing surplus after surplus allowed up by the navy, military works, education and the landlords, while the voice of Ireland, always crying "Give, give," is to be appeased by a bountiful dole next year. Their time seems long in coming, but it will arrive in the end. Tea has become a necessary of life at Home, and a tax of thirty-five per cent. of its value cannot be defended a day after the possibility of relief.

THE "AGRICULTURAL GAZETTE" OF NEW SOUTH WALES, issued by direction of the Hon. Sydney Smith, M.P., Secretary for Mines and Agriculture Vol. VIII. Part 8. Edited by W. H. Clarke. August, 1897. Contents:—Useful Australian Plants, J. H. Maiden; No. 40—The Mulga (*Acacia aneura*, F.v.M.) A Fodder Plant; No. 41—Salt-grass (*Distichlis maritima*, Rafin); No. 42—A Mud-grass (*Chamœraphis paradoxa*, Poir); Botanical Notes; The "Brush" of Wheat Grain, N. A. Cobb; Coccids (Scale Insects) in Sydney Gardens, W. W. Froggatt; Magpies (Black and Gray), Dr. Jas. Norton; Destruction of Rabbits by means of the Microbes of Chicken-Cholera, C. J. Pound; The Fodder Value of Salt-bush, F. B. Guthrie; A Gall-making Diaspid, C. Fuller; The Influence of Bees on Crops, A. Gale; Bee Calendar for September, A. Gale; Orchard Notes for September, G. Waters; Practical Vegetable and Flower Growing for September, W. S. Campbell; General Notes; Replies to Correspondents; List of Agricultural Societies' Shows; Label for Specimens.

PLANTING IN BRAZIL.—Mr. T. L. Villiers, formerly of the Scrubs, Nuwara Eliya, who has just returned to the island with Mrs. Villiers, has come to the conclusion that there are worse places than Ceylon to plant in. It will be remembered that he was engaged by the Directors of the Dumont Coffee Company to take charge of the large and recently-acquired property of the Company in Brazil. Mr. Villiers went with Mrs. Villiers to the estate, but found the life there rougher than he anticipated, and very different to a planter's life in Ceylon. The heat, he says, was very trying, almost as bad as Colombo, and yellow fever was very prevalent in the neighbourhood, so that he managed to get his agreement with the Company cancelled, and left Brazil after a very brief stay. His description of planting life in Brazil is interesting. There are very few English in the country, and they are not popular with the indigenous population. There was a European family on the Dumont Company's property—the Secretary and his wife—but the nearest European doctor was a 16 hours' railway journey away, and the labourer is Italian, with little in common either with the cooly or with the planter. The little narrow-gauge railway that traverses the San Paulo district is the principal means of communication, but there is an accident on it nearly every day, so that, while it is useful for freight, passengers prefer to go round to Rio by sea, as being slower but safer. Brazil coffee growing may be profitable, but is evidently not an occupation for a married Ceylon planter, or for anybody who is not prepared to rough it a good deal. Mr. Villiers has gone up-country, and may be reckoned once again as a Ceylon planter.—Local "Times."

A NEW MIXTURE.—Adulterated tea is played out in these markets. The rise of the Indian and Ceylon tea industries practically put an end to the art of doctoring tea leaves. On the Continent the game still flourishes, and a preparation of adulterated tea-leaves is described in a German medical paper. The preparation has long been known in Russia, where it is sold under the name of "rogogeski." It is made in the following way:—"The manufacturers of this adulterate buy in the tea houses the residue of the teapots—leaves which have already been used—and mix these leaves while still moist with other leaves and very little genuine tea. The mixture is heated with an addition of extract of caramel and campeche wood, in order to improve the colour and the taste. The weight is also increased by the addition of sand or soil, and just before being dried the leaves are rolled between the hands. The adulteration is so difficult to recognise, that a chemical test is necessary to prove it. If tea prepared in this way is dipped into a cold saturated solution of copper the blue colour of the solution will not be changed, not even if the adulterated tea is allowed to remain in it for three or four months. If the tea is fresh and has not previously been soaked, the solution will turn green within a short time."

SUNFLOWER SALAD OIL.—Dr. Wiley, the chemist of the Agricultural Department in Washington, says that in his opinion the coming salad oil will be made of sunflower seed. It is a perfect substitute for olive oil, and will be very cheap.—*American Agriculturist*

ACACIA SEED.—There is quite a dearth of Acacia seed this year in New South Wales—two leading "Seedsmen" firms reporting that the dry season has stopped the trees from seeding. Another firm reports that the only Acacias available, are:—"Acacia Pynantha" S. A. Wattle for Bark. "Acacia Decurrens" N. S. W. Wattle Bark.

THE "INDIAN FORESTER."—Edited by J. Olvier, Conservator of Forests, and Director of the Forest School, Dehra Dûn. Contents for September, 1879:—Original Articles and Translations: Sir Richard Strachey and Indian Forestry by Sir Dietrich Brandis, K.C.D.E., PH. D., LL.D., F. R. S. Correspondence. Esparto Grass, Letter from "Q"; Forest Literature, Letter from "Miles"; Calotropis procera, Letter G. M. R. Reviews: Mathieu's Flore Forestière, Forestry in the Central Provinces during 1895 6, Forest Administration in the Southern and Sind Circles of Bombay during 1895 6. Extracts, Notes and Queries: Timber and Produce Trade Extracts from Official Gazette Appendix Series: Planting up of Shifting Sands near Dresden in Saxony, by A. M. Reuther, Indian Forest Service.

RUBBER AND CEYLON.—The Editor of *The India Rubber World* evidently thinks Ceylon may do for "rubber" what was done for "Cinchona" in a big production! We quote as follows:—

The new director of the royal botanic gardens of Ceylon—Mr. John C. Willis—is a believer in the cultivation of India-rubber as practicable at least for that part of the world. His initial report, recently published, has won high praise from the usually critical *Tropical Agriculturist*, of Colombo. While not underrating the value of the purely scientific work in botany performed by Mr. Willis's predecessors, the *Agriculturist* is pleased at the evident disposition of the new director to devote his attention to the more practical department of economic botany. The most important steps in rubber-cultivation now under way are being taken in Ceylon, where the new director of the royal botanic gardens is addressing himself to the task enthusiastically, in the belief that results of great value are attainable. It is not impossible that his hopes may be grounded on reason. While Mr. Gustav Mann's long experience in Assam led him to discourage all planting of exotic rubber species, the pioneer introducer of Pará rubber-trees into India—Sir Clements Markham— has recorded in *The India Rubber World* his belief that, if the initial attempts had been seconded with proper vigor, that country would now be an important producer of Pará rubber. But supposing Mr. Mann to be entirely right with regard to the localities in which he worked, it may be that Mr. Willis has found in Ceylon exceptionally favorable circumstances, and that the hundreds of planters who in that island are seeding Pará rubber alongside their tea estates may derive a profit therefrom as promptly as the last generation did from their first plantings of tea. Though we Americans are little tempted to invest in rubber plantations under any conditions, we may watch with interest the development so confidently predicted in Ceylon, remembering that we, no less than the rest of the world, have profited from the enterprise shown by the English colonists there for more than a third of a century in the growing of cinchona.

Renewed attention will be called to the subject by the papers laid on the Council table recently which we reproduce on another page and notice.

## "HOW TO ECONOMISE THE AVAILABLE LABOUR SUPPLY ON OUR TEA PLANTATIONS."

### REVIEW OF LETTERS LIV. TO LXII.

The nine letters to be dealt with at present do not occupy as much space as the batch immediately preceding; but they are full of interest nevertheless. "Old Planter," from a Mid-District, adds his own testimony to that of the many experienced men whose letters we have already noticed in favour of wire shoots, as a great labour-saving appliance, whose use should be extended for the transport of both leaf and fuel. In this opinion "T." from a High District concurs; for, although he has had no practical experience of them himself, he has seen them at work. "C.H." has used shoots for firewood, and thinks they might be used a good deal even in the lowcountry, whence he writes. Narrow cart roads for half carts he is in favonr of for large estates, but like the two previous writers he doubts whether tramways could be laid down and worked at a reasonable cost. "F.J.H." from a Medium District testifies to the great saving in labour, shoots effect, while doing little injury to leaf; and so does "O.C." from a High District; but "B.", also from a High District, has evidently had unpleasant experience, as he says much care is necessary to avert damage to leaf. "J.N." from a High District, who has had experience with both shoots and wire tramways on Hunasgiriya, approves of them for firewood; but would prefer wire tramways for leaf, as he thinks shoots would bruise the leaf. Planters, however, who have worked shoots have been able to reduce damage to a minimum; and "Thirty-three years at it," in a High District, cannot see any reason for damage if the shoots be not too steep; and even then a check cord can be used. "W.S." from a Medium District, while admitting some damage from too great length and steepness of shoots, believes that they can be more largely used. Only in very exceptional cases are tramways considered feasible on estates by our correspondents; but "Old Planter" starts a new the yorentirely in suggesting as a labour-saving device, the sending down of all tea, "in special chests made for the purpose," in good stout paper, so that all final firing and packing might be done in Colombo. Even assuming that the Colombo charges will not swallow up the saving anticipated in transport of lead, nails and hoop iron, lessened by the original cost of the special chests and their transport, will planters accept Colombo firing and packing, including perhaps bulking, as a substitute for factory work done under their own eyes? The objection will not, of course, hold except in the case of proprietary planters: but the saving in transport, it strikes us if other objections are overcome, is likely to prove a more important factor than any convenience arising from the saving of labour on Estates. We fear though that experiments already made in this direction have not given satisfactory results.

On the question of weeding, conservatism continues to be the most prominent featuıe. "Old Planter" declares that there is nothing like clean weeding; and that if a rupee per acre per mensem is paid, the charge might be reduced to 50 cents when the tea covers the ground and pluckers have to go their rounds once in eight days, and thus help to keep down the weeds. Small ferns and mosses are not objected to by this writer, who further recommends the closer planting of tea (two plants in each hole 18 inches apart) as an aid to the prevention of wash, and also the planting of grevilleas, whose leaves serve as mulch and do a lot of good, especially in thin tea with a large percentage of vacancies. "T," too, expresses his preference for the present system of monthly weeding which, with the present system of manuring, would scarcely give time for mosses and ferns to grow. "C. H." inclines to the same view, though he allows that selected weeding might do good. "B" is emphatic that weeding has not been overdone, though scraping has been; and "J N." believes in the present system, as having the further advantage of satisfying the kangany and keeping the labour force together, though Indian planters have remarked that weeding is overdone. "Thirty years at it" also gives the weight of his experience in favour of weeding clean, when it can be done under a rupee; while for dirty estates he recommends the taking out of coarse weeds, and the stirring up of the soil once a year to break the hardening surface. So also with "W. S." who thinks weeding has been overdone only when the hoe has been in constant use. The hoe and the karandy he would dispense with, and use "kootchie" instead; but "F. J. H." asserts that weeding is often overdone, and justifies the system on the ground that occasional weeding is very expensive, as our weeds grow all the year round, while in India they give no trouble from October to March. "O. C." while conceding that weeding may be overdone here, objects that kanganies will not stay on estates without weeding contracts. Does not this frequent reference to the kangany imply that he is gaining too much influence? Certainly humour him reasonably; and if the present system of weeding is maintained chiefly to propitiate him by enabling him to supplement his income from head money he should not have the further privilege of practically unlimited "coast advances."

The present system of draining, generally approves itself to most correspondents, some of whom suggest slight modifications, while some would have the drains cut closer. Probably a goodly number of estates answer this requirement, and the writers express only the deficiencies of their own particular charge. "J. N."'s suggestion of a large pit or dam to catch the wash is one which it would not be easy to adopt on most places; but where it can be provided, it should be useful in catching something more than the silt.

We have noticed the importance which older planters attach to personal relations with the cooly, combining firmness and kindness, task work, bonuses for extras, &c. In the batch of letters under notice too, similar suggestions occur; but "J. N." starts a new remedy in a new Labour Ordinance better suited to Tea than Coffee. We are not sure whether all that is needed may not be found in the existing Ordinances; and before longer terms of agreements are asked for, may not we inquire whether contracts are in force for three years, and have been found to be insufficient? There is a general disinclination for new legislation, which has always to be referred to the Indian Government for their consideration and approval.—The remarks on Bazaars and Arrack call for no special comment.

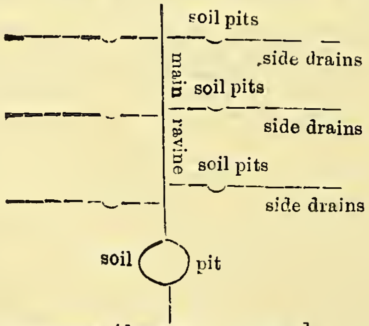
*(Letters Continued.)*

No. LXIII.

1. Yes, I have used them and find them a great saving of labour both for transport of leaf and firewood.
3. Yes, I should think so.
4. No.
5. No.
6. No.
7. I think that as a rule drains are cut at too steep a gradient. If they were cut at an easy gradient, the soil would be sunk in them and thrown out round the tea bushes when the drains were cleared out.
8. None that I know of.
9. I think most estates give the coolies land for gardens.
10. In moderation.
11. No. D.

No. LXIV.—High District.

1. Yes, have had a large experience of wire shoots (have worked five shoots myself: and there have been nine shoots on the three estates on which I have served, and I have seen six others working on various estates). In this district I know of and have seen five shoots now being worked for leaf transport, and some of them for firewood. I have a shoot 1¼ mile long on my present charge, and another shoot, ¾ mile long, also comes from a neighbour's estate to my factory for leaf transport. They do not damage the leaf: provided a sufficient supply of mana grass, or other soft substance, is heaped at the bottom of the shoot, to act as a buffer. I believe wire shoots are in general use where the lay of land admits of them, as a saving in transport by coolies.
2. Endless tramways might be more generally used for transport by groups of estates in hilly steep districts. For instance an endless tramway from Padupolala to the top of Kurunduoya or High Forest, could be made to serve Alma, Greymont, Seaton, Kurunduoya, Rillamulla, Bramley, Lauriston, High Forest: for the down transport of tea, boxes of tea, and the up transport of manure, tea requisites, rice, &c. Such tramways are used on the Glen Alpine, Rock Hill, and Spring Valley estates for manure transport. Where tramways are not compatible with the lay of the land, tavalams might be used for tea transport, but the boxes would have to be made narrower and longer; this has, I believe, been tried on Dehigolla estate.
3. Not on ordinary estate roads: they might be on cart roads, or roads of a good gradient.
4. Yes. I feel sure it is overdone.
5. Yes.
6. No. I would like to see the experiment tried.
7. Fairly so. Large holes might be cut at intervals along the drains to catch soil washed into it, and this soil might be afterwards distributed over the adjoining ground, as each hole fills up. Thus:—




The cuscus grass idea seems very good.
8. Telephones between factories and bungalows often save coolies as messengers. District tapal coolies would be another saving, or one tapal cooly to each group of estates.
9. Plenty of ground for gardens, the allowing of coolies to keep cows and pigs, and goats; all tend to make them contented (gardens especially).
10. Yes! Strongly.
11. Yes! Liquor shops ought to be done away with. D. E.

No. LXV.

1. Yes, I think wire shoots could be advantageously used much more largely for transport of fuel and leaf. The leaf is not injured by being sent down by a shoot.
2. The widening of existing roads, where practicable, to admit of single bullock carts being used, saves cooly labour to some extent.
3. I have no experience of small tramways and do not know what they would cost per mile.
4. I have never thought that small weeds do the least harm to either tea or coffee and they undoubtedly save wash. But it is *cheaper* and takes *less* labour to keep an estate quite clean than to allow small weeds to grow. Otherwise *I* think it would be better to leave them. Mosses should certainly be left to grow.
6. No, nor do I think it would answer.
7. Terracing was largely carried out on Delta and other old coffee estates, and did some good. But I do not think anything will stop the wash on the steep hills of Ceylon after the land is once cleared.
8. I know of none that would answer, beyond doing as much as possible by machinery in the factory and transporting by cart roads and wire shoots wherever practicable.
9. Coolies should certainly be allowed small gardens and they are on most estates. They should be always supplied with good rice and always of the same quality as far as possible. Large advances make coolies more unsettled than anything else.
10. I think multiplying boutiques might do some good and this is being done in several places. But I expect most of the coolies would always go to the large bazaars on Sundays.
11. The number of liqour shops, should be reduced as much as possible, and it is not altogether desirable that the monopoly of selling liquor should be in the hands of a very few, as they would sell poisonous stuff at extortionate prices. Coolies will go a long distance to get liquor, but numerous liquor shops, of course, increase the temptation to drink.

MERCHANT PLANTER.

No. LXVI.—Medium District.

I have your circular on "How to economise the available Labour Supply."

The Labour Supply in most districts is now ample for all requirements; in districts where it is not, I would suggest a little more honesty in all dealings in connection with labour, and an honest endeavour to procure coolies from the coast; they, coolies, are to be procured; but so long as planters encourage the present buying and selling of coolies, and wink at all kinds of malpractices, districts that are short of labour will continue so.

Labour appears to be coming in from the coast very freely this year. [Written some time ago.—Ed.]

To those who will give up trafficking with the labour force of their neighbours and other districts, and who will honestly attempt to get fresh labour from the coast, I believe that the present is a very favourable opportunity.

I don't care to offer an opinion about *working*, etc.

*Keeping Coolies.*—The man who can get coolies, can keep them. The man who finds difficulty in getting them, cannot. Coolies know very well when they are well treated and want no bribes to stop; where they are badly treated no bribe will keep them.

G.

No. LXVII.

Was your circular of 20th instant sent to me as a joke?! I am afraid I can't throw much, or any, light on the subjects regarding which opinion is asked,

If you had asked me for an essay on the present troubles attending the working of the Labour Ordinance I would have been more pleased!

With respect to suggestions as to keeping labour, I found, in working my places in Badulla, that the giving of ground for gardens to each of the lines attracted and kept coolies. Another attraction to them was the great number of jak and arecanut trees I had on Brechin, by the stems of which I encouraged the coolies to plant betel vines. I was never hard-up for labor on Brechin; but those times have changed; heavy advances were unknown then.

I don't know that the multiplication of bazaars in the neighbourhood of estates, is an unmixed blessing. Still the coolies undoubtedly appreciate the convenience of a nearness of bazaars whence they can get their provisions.

What my opinion is about liquor shops, I have endeavoured to embody in the report of the Sub-Committee P.A., on the arrack question, of which I was a member. I am strongly of opinion that liquor-shops should be lessened in the country; at the same time it is undoubtedly true that arrack, fairly pure, is sold in taverns; while it is an ascertained fact that vile adulteration comes in when the arrack is illicitly sold. It is a matter for much regret that kanganies themselves illicitly retail arrack *in the very lines* to the coolies. So that the close proximity of liquor shops really makes no difference—if any, it is rather favourable to the cooly who gets purer stuff to drink.

These are my crude ideas—next time, ask me something about Law or Procedure!

LAWYER-PLANTER.

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## LXVIII.

*(By an Old Planter.)*

Aberdeen, Sept. 15th, 1897.

From the papers to hand by last mail, I see you are still putting questions to your Upcountry friends; permit me to answer from this distance, although it may be somewhat late in the day for publication.

No. 1. Yes, for transporting fuel, but not for leaf. Certainly, they might be more freely used than they now are. In some of the places of amusement in England, they are a great source of amusement as a means of getting from one place to another, simply by hanging to the hook attached to the pulley. The travellers did not seem to have the slightest fear of any accident: even two went along the shoot, hanging from the same pulley. You may yet hear of shoots being connected to the factory from the bungalow on some estates, as being the quickest and safest way of getting to the factory!

No. 2. In the field, by the use of saws, when they can be used, instead of employing axes for cutting fuel, also all the best tea machinery required including a tea-packer and circular-saw. Under this heading might be included the chests made by the Acme Tea Company, as they are far more easily put together than wooden chests.

No. 3. On an estate of an easy lay of land, tramways might be laid to be worked profitably, but hand-carts costing less, or even light bullock-carts would meet all the requirements equally well.

No. 4, 5, and 6. No, certainly not; weeding three times in two months is preferable in my opinion to once a month, and it is the best and cheapest way of tackling a weedy estate and keeping it clean. I look on a plant out of place as a weed, and prefer a clean estate.

No. 7. The present system I consider very satisfactory, and an improvement on the old coffee-day system, inasmuch as, that the drains are generally closer than they were then.

No. 8. If leaf be weighed only twice daily, try three times a day for a month, and, instead of having a staff of men spreading leaf in the factory, make the leaf carriers always spread their own leaf. It has been found that with a man looking after them, the work is quicker, and ought soon to be equally well done, and at less cost.

No. 9. Perquisites are always acceptable to coolies, and from their birth onwards, they are always in need of any thing master is pleased to give; special needs are constantly arising, from the time the cooly enters the world till he leaves it. Estates having cattle establishments with plenty of milk to give to the young children, and the sick, are always favourite estates with coolies; also where land is allowed near lines suitable for cooly-gardens. These gardens may not always be well kept, but a good cooly likes his garden and will often be seen working it on Sundays and till late on week nights. Coolies, the so-called owners of gardens, are not so easily enticed to leave an estate as coolies are who have no gardens. Supplying coolies with cloths and cumblies direct, and charging them to their accounts is preferable to their buying them in the bazaar,

No. 10. I believe in allowing a few boutiques to be on a large estate, and a small kaddai for the sale of curry stuffs, etc., in a room of the lines on a small one.

No. 11. The illicit sale of drink (arrack) and especially *toddy* does more towards demoralizing the cooly, than even the indiscriminate issuing of so-called, coast advances.—Yours truly, J. W.

[This concludes the discussion raised by our Circular on "how to economise the available labour supply," and we have to thank the several correspondents who have answered our questions; the whole discussion will be reprinted in pamphlet form. —Ed *T.A.*]

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## FINAL REVIEW—LETTERS LXIII. TO LXVIII.

Our task now is to offer our final comments on the last six letters of the series, and a pleasant duty it is, equally in view of the prospect of finality to our labour in this direction, and because of the value of the information we have been able to bring together, through the courtesy and powers of observation of so many planting friends. To deal, however, with the letters immediately before us: first, "D." informs us in the briefest possible terms that he has had experience of wire shoots and has found them a great saving of labour in the transport of both leaf and and firewood; that he thinks tramways should be useful, that weeding is not overdone, and that he is not favourable to any crop being grown to be dug in; that drains as a rule are cut too steep, and that an easy gradient would render the soil available for the adjacent tea bushes; that he is a believer in bazaars in moderation, but not in liquor! "D.E." from a High District claims extensive and varied experience with shoots himself, and has seen them at work on other estates: he has one on his present charge 1¼ mile long, and another of ¾ mile brings leaf to his factory from a neighbouring estate; and his verdict is that leaf is not damaged where a buffer of mana grass or other soft substance is provided, while shoots undoubtedly save labour. Endless tramways, he thinks, might be more largely used, and he instances the facilities to a large number of estates which one from Padupolala to the top of Kurundu-oya or High Forest would afford, for fetching up rice, manure and tea requisites, and sending down tea and tea boxes. Such tramways have, in point of fact, passed the experimental stage for manure transport on the Glen Alpine, Rock Hill and Spring Valley estates; but where the lay of the land does not favour these wire tramways, tavalams are recommended for tea transport in narrower and longer boxes than are now in use, and which have been tried on Dehigolla. Ground tramways are voted unsuitable on ordinary estate roads,

"Merchant-Planter" shares the opinion that shoots might be more largely used for fuel, as well as for leaf which is not injured in transport with care; and, while disclaiming knowledge of tramways, he advocates the widening of existing roads for single bullock carts as a means of saving transport labour. "G." from a medium district brushes off our questions as evidently altogether out-of-date. The labour supply in most districts, in his view, being ample for all requirements, the need of economizing labour does not seem to him to arise. Where labour is wanting, honest dealing will secure it; and the present is regarded as a good time for men turning over a new leaf—not the leaf in regard to the transport of which other planters are exercised!—and placing the Indian labour centres under contribution honestly for an adequate supply. Having persuaded himself of the general sufficiency of labour, and prescribed the best way of securing a supply in the exceptional circumstances in which it may be insufficient, "G." feels that those who can get coolies can keep them, through the recognised agency of good treatment, and he declines to offer any opinion about working. The conclusion whereof is, that "G." is a happy man with his labour, save when a crimp is about, at sight or sniff of whom he waxes grumpy; and that he wants neither to learn more than he knows, nor to teach those who may wish to know, you know! "Lawyer Planter," is somewhat of "G.s" way of thinking; for he would much rather have been asked for an essay on labour troubles, on which he would seem to hold strong views, than for suggestions on the utilization and economizing of the existing labour force. "J. W.", however, although in far-off Aberdeen, has been carefully following the discussion in our columns, and he votes for the more extensive use of shoots, but not for leaf In the absence of the unmanufactured leaf in England, the people there are manufacturing amusement out of shoots, by hanging on to the hook attached to the pulley, and transporting themselves from one place to another (presumably terrestrial); and from the safe distance of the granite city he contemplates the possibility of providing for rapid locomotion from bungalow to factory! Whether the general adoption of the suggestion may not lead to a reduction in the extravagant rates now charged by Insurance Companies on planting lives, is a question we should like to see discussed! Though tramways may be laid and worked profitably on an easy lay of land, "J. W." believes that hand carts and light bullock carts should meet all requirements equally well at a smaller cost; and he also advocates the use of saws, instead of axes for cutting fuel; the use of the best tea-machinery, including a packer; and also acmè chests, as a means of saving labour.

On the question of Weeding, "D. E." feels sure that weeding is overdone, and that selected weeding might be adopted, as also experiments with green crops to be dug in; while he favours us with a sketch showing how soil pits in side-drains and at the foot of the main ravines might conserve soil to be applied to the fields at each clearing out. Cuscus he welcomes as a good idea; he would have telephones between bungalow and factory to save coolies as messengers, and also a district tappal cooly, or a cooly for each group of estates; he would give plenty of ground for gardens, and allow goats, pigs and cattle to be kept by coolies; he would have more bazaars and do away altogether with liquor shops. "Merchant-Planter" recognises the impossibility of doing more than reducing liquor shops; but he would not create a monopoly which would lead to the sale of bad liquor and exorbitant prices: on the other hand, he would multiply boutiques. In addition to humouring coolies with gardens, he would give them good rice, of fairly even quality. While always holding that small weeds could never do harm either to tea or coffee, at the same time that they prevent wash, he regards it cheaper and a greater economy of labour to keep an estate quite clean than to allow small weeds to grow; but mosses he would let alone. Terracing is useful, but wash is inevitable on cultivated hill sides "Lawyer-Planter's" experience of jak and arecanut trees for their own sakes, and as supports for betel vines, as inducements to coolies, is interesting; and while he thinks that the multiplication of boutiques is not an unmixed blessing, he holds strong views on the mischief done by arrack especially when illicitly sold, as it is athen impure, and when ganics are in kau the illicit trade. "J. W. holds strongly that weeding is not overdone, and he would even weed thrice in two months, as cheaper than monthly weeding; the present system of drainage has his approval as an improvement on that of the old coffee days when the drains were wider apart; he would save labour by making the leaf carriers spread the leaf in the factory, and by weighing the leaf thrice a day; and he would humour the coolies with garden patches which help to keep them on an estate, together with small perquisites; he would allow a few boutiques on a large estate, and would check the illicit sale of arrack and toddy, as more demoralizing even than so-called coast advances.

These, then, briefly are the substance of the final batch of latters and our comments on them; and it may be well to indicate, in a few words, the impression left on our minds by the series of letters as a whole which our circular elicited:—(1) Tramways are unsuited to most estates, and their initial cost stands in the way of their use, except under very exceptional circumstances. (2) Wire tramways are doing good work on the few places on which they have been erected, and their extended use should follow the high appreciation of them which our circular has elicited. (3.) Wire shoots are in tolerably extensive use; and their use is likely to spread, through the removal of the prejudice against them for the transport of leaf, on the strength of the testimony of experienced planters who have reduced the damage to leaf to a minimum by the exercise of ordinary care. (4) Among other labour-saving appliances must be included roads, carts, telephones, up-to-date machinery and a well ordered Factory—all directed by strict, yet considerate oversight. (5.) The great majority of planters prefer clean weeding, partly on the principle that what is, must be best, and, partly, because the kangany must be propitiated, and weeding contracts have been his immemorial and most welcome perquisite; but a few who are not afraid to tackle a new difficulty are experimenting with water holes and selected weeding, as a means of reducing wash and conserving the soil-constituents. (6.) The principle is sound of the system of drainage; but modifications, called for by local circumstances, should be more readily adopted. (7.) The multiplication of boutiques carries with it risks of theft of produce, illicit sale of arrack, and growing indebtedness. (8.) Arrack Taverns

and Liquorshops are an evil; but they are the lesser of two evils; as, in their absence, illicit traffic is inevitable. (9) Just, firm treatment of the cooly is the great panacea for labour troubles and discontent; and to secure this, the master must be in touch with his men, sympathise with them, and not be too often absent from the estate, whether on pleasure or business.

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## PROGRESS IN THE STRAITS.

From a Report by the Commissioner of Lands and Mines, F.M.S., dated Kuala Lumpur, 12th August, published in the *Negri Sembilan Government Gazette* of Oct. 15th, we quote a few passages of planting interest:—

After driving for some thirteen miles, from Seremban, through a succession of coffee estates—all except one of which are in the hands of European owners, and the healthy growth of which, notably in the case of the older plantations superintended by Mr. Dunman, is a pleasing augury of future success—we exchanged the dogcart for our horses, and rode for another thirteen miles on a track running through continuous kampong and sawah land to Chenong, where we halted for a midday rest.

The country lying between Kuala Pilah and the foot of the hill is at least as noticeable for picturesque scenery and continuous cultivation as any which we passed through during the course of our tour. The long valley by the side of which the road runs is one extensive padi field, and every little valley which diverges from it is utilised for the same purpose. The higher lands which fringe the valley have evidently been under cultivation for a large number of years, the fruit trees being for the most part mature, and, in many instances, of grand proportions.

I have seen stretches of country in other parts of the Native States exhibiting the same features of valleys emerging from among the spurs of the hills, and alternating with higher and undulating ground, but never have I seen any attempt to form those valleys into padi fields in a manner or to an extent which will bear even momentary comparison with what is regularly done in the Negri Sembilan. These States are not naturally more productive than other places. What has been done there can be done elsewhere, and for some considerable period in the future the States of the Negri Sembilan (old) will stand as an example of what can and should be done for the land by the native agriculturist.

Then from Report of the District Officer, Tampin for July, 1897.

On the 22nd we left Kuala Gemencheh, at 7·30 p.m., and walked over the footpath to Kelamah Tapioca Estate and thence to another estate at Chembul. The distance walked was about 20 miles, and the journey occupied the whole day. Between Kuala Gemencheh and Kelamah, at a place called Ladang, there is a beautiful expanse of padi country, at present abandoned; I trust, however, it may ere long be brought into cultivation again by a scheme which I have proposed in a separate communication.

At Kelamah the managing partner of the estate, Li Kah, met us and accompanied us to Chembul, where we stayed the night at a very nice little house erected by Li Kah for his own use. Li Kah, who manages both Kelamah and Chembul Estates, complained that owing to the bad state of the Malacca roads he had hitherto been unable to export much of his tapioca and had 1,000 bags at Chembul and 2,000 at Kelamah awaiting export. As (owing to the dry weather) the state of the roads had improved, he asked assistance to enable him to get these large quantities of tapioca out as soon as possible. I have since detailed a clerk to weigh the tapioca at his factories, with the result that over 2,000 pikuls were weighed and exported during August, bringing in about $500 duty.

## DRUG REPORT.

(*From the Chemist and Druggist.*)

London, Oct. 7.

The Markets show several interesting features this week. Quinine has been the chief centre of interest. The spice-boom is still raging, but has shifted from white pepper to cloves.

VANILLA.—The following figures are supplied to us as being the "authentic" particulars relating to the Eastern vanilla crops of 1897 and 1896:—

| Place. | Bourbon. | Seychelles. | Mayotte. | Madagascar. | Mauritius. |
|---|---|---|---|---|---|
| | kilos. | kilos. | kilos. | kilos. | kilos. |
| 1896 | 98,000 | 25,000 | 13,000 | 2,500 | 2,500 |
| 1897 | 100,000 | 13,000 | 8,000 | 2,000 | 2,000 |

The total output in 1897 is therefore about 13 per cent less than last year—viz. 125,000 kilos, against 141,000 kilos. In these figures no account is taken of the small production of the West Indies, Ceylon, &c., nor of the large crop of Mexico. The London market remains firm, and a fair amount of business has taken place privately at steady rates since the last auctions. It seems likely that prices will keep at their present level until Christmas and New-Year's wants have been filled.

CINCHONA.—The average quinine content of the manufacturing barks at last Thursday's auctions at Amsterdam was the highest on record. Not so very long ago a 5-per cent average was considered a high one; last week it was 6·10 per cent. The richest parcel offered was one of 27 bales le geriana crushed bark, analysing 9·24 per cent. This realised 58c. per ½ kilo. The highest unit paid was 7c., at which 2,126 kilos of bark changed hands, the lowest 5¾c., at which 921 kilos sold. The tone was very animated throughout the auctions, and improved steadily towards the end. The general opinion is that a further advance is imminent. Druggists' barks realised irregular but generally higher prices. There was an especially good competition for crushed Succirubra, which was readily brought by cinchonidine manufacturers. The following figures show the result of the first eight Amsterdam auctions (Jan.-Oct.) of the past five years:—

| Year. | Total weight of bark offered. | Representing sulphate of quinine. | Average content of manufacturing bark. | Total weight of quinine sold. | Total weight of quinine bought in. |
|---|---|---|---|---|---|
| | kilos. | kilos. | per cent. | kilos. | kilos. |
| 1897 | 4,005,504 | 221,038 | 5·26-6·10 | 186,444 | 34,614 |
| 1896 | 4,528,277 | 240,309 | 5·05-5·83 | 202,126 | 35,183 |
| 1895 | 4,636,859 | 225,367 | 4·63-5·17 | 141,314 | 84,053 |
| 1894 | 3,443,031 | 161,659 | 4·61-5·12 | 125,727 | 35,932 |
| 1893 | 3,930,594 | 172,982 | 4·23-5·02 | 97,679 | 75,303 |

The exports of cinchona-bark from Maracaibo, S. America in 1896 amounted to 161 cwt.

COCOA-BUTTER.—At auction on Tuesday 200 2-cwt. cases of Cadbury's best cocoa-butter sold at from 12¾d to 13d per lb., being an advance of 2d on the last public sales. For 150 cases of Dutch cocoa-butter a bid of 10⅝d per lb. was rejected, and the lot was bought in at 11½d per lb. At the Amsterdam public auctions held on Tuesday about 80 tons of Van Houten's cocoa-butter were offered. Of this quantity 28½ tons sold at up to 60c. per half-kilo. The only other parcel sold was one of 7 tons Dutch ("Hammer") cocoa-butter, which realised 55½c. per half-kilo. Several lots of different brands were bought in. The market generally is quiet.

KOLA.—The demand has been slightly better recently but London holders have some difficulty in competing at present, Hamburg and Liverpool both offering at lower rates. In the last-named place there seems to be a big stock.

KOLA-NUTS are held for higher prices at last Thursday's auctions. Ordinary slightly mouldy good bright West Indian sold at from 4¾d up to 8d per lb., and 19 packages wormy and mouldy African kolas were also disposed of.

ESSENTIAL OILS.—Lemongrass oil is rather dearer, and the cheap lots offering in London at 2¾d per oz. have been bought up, and 3d is now asked on the spot. To arrive nothing is offering. Citronella oil steady at 1s 2½d per lb. in tins, and 1s 2d in drums. To arrive the quotation is 1s 1¼d per lb. in drums, c. i. f. terms, shipment to end of year.

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**DEAFNESS.** An essay describing a really genuine Cure for Deafness. Ringing in Ears, &c., no matter how severe or long standing, will be sent post free.—Artificial Eardrums and similar appliances entirely superseded. Address THOMAS KEMPE, VICTORIA CHAMBERS, 19, SOUTHAMPTON BUILDINGS, HOLBORN, LONDON.

## PLANTING NOTES.

COFFEE from British Central Africa, says a correspondent of the London *Times*, is fetching higher prices in Cape ports than any of the other kinds usually imported. It is far superior to Java or Rio coffee.

THE MANURING OF TEA.—Writing on the 1st Oct. from London, Mr. John Hughes says:—"Your letter of the 8th Sept. respecting the traffic returns on the railways for manure duly to hand, and I thank you for the explanation. I imagine there is very little increase in the use of manure either for tea or coffee."

STOOLING OF GUTTA PERCHA.—The question whether the tree yielding gutta purcha (*Dichopsis Gutta*, Benth.,) will produce shoots from the stump after the tree has been felled is of some practical importance. It appears now to have been disposed of in the affirmative:—Extract from letter from Director, Gardens and Forest Department, Singapore, dated July 3rd, 1897. *Re* Professor Ramsay's letter about stooling of "Getah percha." The tree always comes up again when cut down. It can be cut to within six inches of the ground, and will then throw up shoots. Were it not for this there would hardly be a single specimen in this country. It grows slowly in this manner, but never fails to come up again. It is a very troublesome plant to propagate by cuttings, but this can be done.—*Kew Bulletin.*

THE MANGO.—With reference to the suggestion recently made that there should be a demand at home for the Indian mango, the cultivation of which was strongly recommended by Sir George Birdwood, whilst secretary of the Agri-Horticultural Society, it is interesting to find in this connection that the Government of Queensland lately sent an experimental cargo of mangos to London. The fruit was kept at a constant temperature of 45deg Fahrenheit during the voyage, and arrived here in excellent condition. As mangos thrive in the West Indies, no doubt some of the fruit will sooner or later be sent over here from British Guiana and the West India islands.—*H. & C. Mail*, Oct. 8.

GOVERNMENT CINCHONA GARDENS IN JAVA AND INDIA.—The *Chemist and Druggist* of Oct. 2 in discussing the annual report on the Madras Cinchona gardens, remarks:—

It is generally known that, unlike the Java Government gardens, whose bark is sent to Amsterdam to compete in the open market with the barks grown by private firms, the Indian Government do not compete with private traders in Europe. They sell all their product to the Indian Medical Stores, and to native consumers—quinine at 18r., and febrifuge at 16r., per lb. The average yield of the Crown and hybrid barks treated during the year was 3·32 per cent. of quinine and 1·39 per cent. of febrifuge; that of the red bark 4·45 per cent. of febrifuge. The sale of cheap Government quinine and febrifuge to the Indian native population is increasing very slowly. In 1896 it only amounted to some 2,000 lb.—an advance of about 10 per cent. on the previous year. The bulk of these sales takes place through the 1,550 village postmasters in the Presidency, who retail it in 5-gr. packets. The Medical Stores Departments at Bombay, Calcutta, and Madras are the best customers of the gardens. In the course of last year the Madras cinchona department was separated from the botanical department. Mr. David Hooper, the Government Quinologist, was temporarily appointed assistant to Dr. Watt, the Reporter on Economic Products to the Government of India, and he has since been definitely appointed assistant-curator in the Indian Museum at Calcutta. Mr. Stander is therefore now in sole charge of the Nilgiri cinchona-gardens. It is to be hoped that the experiment of appointing a practical planter and businessman instead of an official, which has been attended with so much initial success, will continue to work well in the future.

GREVILLEAS.—They are so taken with the great value of grevilleas in tea, that Ceylon planters are now asking themselves whether, if planted out in their now abandoned coffee, their old favourite might have been saved. For an answer, they need only turn to South India, where the silver oak enjoys enormous popularity. —*Planter*, Oct. 16.

ASCLEPIAS CURASSAVICA AS AN INSECTIFUGE.—The use of this plant for the purposes described in the following communication appears to be unrecorded:—Rostherne, Red Hill Surrey, July 21st, 1897. Miss Manning would be greatly obliged if the Director would tell her what the enclosed plant is. It grows everywhere, as a weed, about the Isthmus of Tehauntepec (Southern Mexico), and is used by the Indians there to keep away vermin, especially fleas. Miss Manning's friends in Mexico have tried it, and found it most successful. They make a rough broom of it, and sweep the floors and walls of their huts, and find that they are not troubled with fleas for a considerable time afterwards. They have tried brushing dogs with it when their coats are full of vermin, and it appears to answer the same purpose with them. The Indian name of the plant is "Chilpati."—*Kew Bulletin.*

THE MALAYAN COFFEE PLANTERS.—In a recent issue of the *Straits Times*, a correspondent, signing himself "A Planter," protests against a scheme laid before a committee of the United Planters' Association of the Federated Malay States. The scheme suggested that all parchment should be shipped to a curing establishment at Colombo and dealt with there; all the parchment on arrival at Colombo to be sampled and approved; the whole to be pooled or each shipment to be sold separately under estate mark. He urges that the Association should pass a resolution asking the Government of Selangor to give the Association a piece of ground at either Klang or Kuala Klang for the purpose of erecting a curing mill. In a letter to the same paper Mr. E. V. Carey points out that the scheme which the Committee of the U.P.A. is drawing up is only in an embryo state, that the Colombo project was only one of several laid before that body for consideration and that on the agenda for the next meeting of the Association there is a proposal to ask the Government of Selangor to give a piece of land as a site for a curing mill.

ARGENTINE PALM KERNELS.—The palm-kernels to which the following communication relates, were identified at Kew as those of *Acrocomia sclerocarpa*. This is known as the Gru-gru or Macaw palm. It is a native of Jamaica and other West India islands, and of South America from Brazil southwards. The nuts do not hitherto apppear to have been turned to any use, though their shell, which is very hard, has been sometimes used for carving.—African Association, Limited. 35a, Castle Street, Liverpool, May 25th, 1897. Dear Sir,—My Board instruct me to ask the favour of some information from your department in regard to a considerable quantity of palm kernels lately arrived at this port from the Argentine Republic. They are informed that a very large tract of country produces the plam from which these kernels are gathered, and seeing the large interest of this Association in palm kernels from the Nigar Coast Protectorate and other West African districts, my Board are naturally desirous to get what informaton they can in respect to this new competing product. Can you for their information be so kind as to say, is the palm of the Argentine region a true oil-palm, and would the fruit or kernel of this palm be likely to compare closely or differ considerably in oily product, from that in which this Company is interested.—Yours faithfully, (Signed) J. HAMPDEN JACKSON, Secretary. The Director, Royal Gardens, Kew.—*Ibid.*

## COLOMBO PRICE CURRENT.

*(Furnished by the Chamber of Commerce.)*

Colombo, Oct. 19th, 1897.

EXCHANGE ON LONDON: CLOSING RATES. *Bank Selling Rates*:—On demand 1/3 21-32 to 11-16; 4 months' sight 1/3 11-16 to 23-32; 6 months' sight 1/3 23 32 to ¾.

*Bank Buying Rates*:—Credits 3 months' sight 1/3 15-16 to 31-32; 6 months' sight 1/4 Docts 3 months sight 1/3 31-32 to 1/4; 6 month sight 1/4 11-32.

COFFEE.—Plantation Estate Parchment on the spot per bushel R14·00 Very scarce; nominal. Estate Crops in Parchment, delivery per bus. no quotations. Plantation Estate Coffee, f.o.b. on the spot per cwt. R81·00 No transactions; nominal.
Liberian parchment on the spot per bus. R5·50.
Native Coffee f.o.b per cwt. R61·00.

TEA.—Average Prices ruling during the week Broken Pekoe, per lb. 51c. Pekoe per lb. 42c. Pekoe Souchong per lb. 31c. Broken mixed and Dust, per lb. 22c. Averages of Wednesday's sale.

CINCHONA BARK.—Per unit of Sulphate of Quinine per lb 06½c.

CARDAMOMS.—Per lb R2·55 R3 for special.

COCONUT OIL.—Mill oil per cwt. R13·00.
Dealers' oil per cwt. R13·00 Coconut oil in ordinary packages f.o.b. per ton R292·50.

COPRA.—Per candy of 560 lb. R39·50

COCONUT CAKE: (Poonac) f.o.b. (Mill) per ton, R75·00
Cocoa unpicked and undried, per cwt. R41 Very scarce.

COIR YARN.—Nos. 1 to 8 { Kogalla R17·50, Colombo R16·25

CINNAMON.—Nos. 1 & 2 only f.o.b. 63c.
Do Ordinary Assortment, per lb 56½c.

EBONY.—Per ton No sales.

PLUMBAGO:—Large Lumps per ton, R350
Ordinary Lumps per ton, R340
Chips per ton, R195. Dust per ton, R140 00

RICE.—Soolye per bushel, { R4·00 to 4·40
" per bag, { R10.25 to 11·40
Pegu and Calcutta Calunda R10.50 to 11.50
Coast Calunda per bushel, R4·00 to R4·40
Muttusamba per bushel, R4·15 to R4·60
Kandappa and Kuruwe per bushel, R4.15 to 4 20.
Rangoon Raw 3 bushel bag.—R10.60 to 11.25

FREIGHTS.

| Cargo. | Per ton London per str. | N. York per str. | Trieste per str. | Mar'lles per str. | Hamb', Bremen &c. |
|---|---|---|---|---|---|
| | s. d. | s. d. | s. d. | R. c. | s. d. |
| Tea | 25/ | 25/ | 22/6 | 25·00 | 22/6 |
| Coconut Oil | 22/6 | 22/6 | 22 6 | 25.00 | 22/6 |
| Plumbago | 22/6 | 22/6 | 22 62 | 25.00 | 22/6 |
| Coconuts in bags | 22/6 | 22,6 | 22,6 | 25.00 | 22 6 |
| Other Cargo | 22/6 | 22/6 | 22 6 | 25.00 | 22/6 |
| Broken Stowage | 12 6 | .. | .. | 20 | .. |
| SAILERS. | | | | | |
| Coconut Oil | .. | 25/ | .. | .. | .. |
| Plumbago | .. | 25/ | .. | .. | .. |

## LOCAL MARKET.

*(By Mr. A. M. Chittambalam, Baillie St., Fort)*

Colombo Oct 27th, 189

Estate Parchment per bushel R13·75 to 14·25 Nominal
Chetty do do do R12·50 to 13·00 do
Native Coffee unpicked per cwt R45·00 to 48·00
do F.O.B. per cwt. R52·00 to 55·00
Liberian coffee per bushel R6·00 to 7·00
do clean coffee per cwt nominal R38·00 to 40·00
Cardamoms per lb. R1·50 to 2·25 little doing
Cocoa unpicked per cwt. R30·00 to 35·00
do picked do R37.00 to 45·00
Rice Market.—Likely to go down.
Sooly Scarce per bag R10·.0 to 11 00 nominal
Callunda Scarce
Coast Callunda 4·12 to 4·25 per bushel
do Kara 4 10 to 4·20 do
Muttusumba 4.30 to 4·50 do
Cinnamon per lb No 1 to 4 54cts to 56c.
do do 1 & 2 58c. to 60c.
do Chips per candy R30·0 ı
Coconuts Ordinary per 1000 R30·00 to 34·00
do Selected do R38·00 to 40·00
Coconut Oil per cwt, R12·87½ to 13·12½
do per ton F. O. B. R292·50 to 297·50
Copra per Candy.—
Kalpitiya do R37·50 to 38·00
Marawila do 35·00 to 37·00
Cart copra do 30·00 to 34·00

Poonac Gingelly per ton R85·00 to 87·50
do Chekku do „ 85·00 to 90·00
Mill (retail) do „ 80 00 to 85·00
Croton seed do „ 80·00
Satinwood R1·75 to 2·25 cubic feet
Halmilla R1 to 1·50
Ebony per ton R100 to 185
Kitul Fibre per cwt. „ 30·00 to 32·00
Palmyra Fibre:—
Jaffna Black clean per cwt. R20·00 to 22·00
do Mixed do „ 18·50 to 19·00
Indian do do „ 0·00 to 14·00
do Cleaned Nil
Sapan wood per ton R55·00 to 60·00
Kerosine Oil American per case R7·25 to 7·30
do Bulk Russian tin R2 68 to 2·73
do Sumatara in case „ 5·10 to 5 15
Kapok Cleaned f o b per cw R27·00 to 29·00
do Uncleaned do „ 6·00 to 7·00 Nominal
Croton Seed per cwt R38·00 to 45·00 Scarce
Nux Vomica per cwt R4·00 to 5·00 nominal

| Plumbago per ton, according to quality | | |
|---|---|---|
| | Large lumps | R250 to 350 |
| | Ordinary „ | R220 to 340 |
| | Chips | R100 to 200 |
| | Dust | R 60 to 120 |

## CEYLON EXPORTS AND DISTRIBUTION.

1896-97.

| COUNTRIES. | Coffee cwt. Plantation | Coffee cwt. N'tive | Coffee cwt. Total. | Cinchona. 1897 B'nch & Trunk lb. | Tea. 1897 lb. | Tea. 1896 lb. | Cocoa cwt. | C'moms lb. | Cinnamon Bales lb. | Cinnamon Chips lb. | Coconut Oil 1897 cwt. | Coconut Oil 1896 cwt. | P'bago 1897 cwt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To United Kingdom | 11733 | .. | 11733 | 312167 | 79444728 | 75619750 | 22668 | 205837 | 888510 | 201678 | 58770 | 68285 | 123129 |
| „ Austria | 247 | 2 | 249 | .. | 14960 | 29861 | .. | .. | 7600 | 37800 | 6794 | 18470 | .. |
| „ Belgium | . | 1 | 1 | .. | 10131 | 30695 | 211 | .. | 74400 | 66248 | 1132 | 3209 | 31381 |
| „ France | 600 | .. | 600 | .. | 81496 | 44974 | 232 | ... | 52600 | 18960 | .. | 114 | 411 |
| „ Germany | 216 | .. | 216 | 4132 | 221274 | 95573 | 271 | 29330 | 565688 | 309990 | 5254 | 14333 | 55600 |
| „ Holland | 58 | . | 58 | .. | 19775 | 6120 | .. | .. | .. | .. | .. | 400 | 1375 |
| „ Italy | -- | . | . | 3132 | 5071 | 9730 | .. | .. | 136200 | 120052 | 269 | 1813 | 41 |
| „ Russia | -- | .. | .. | .. | 373192 | 224012 | .. | .. | .. | .. | 299 | 81 | .. |
| „ Spain | .. | .. | .. | .. | 26570 | 46635 | .. | .. | 194760 | 9240 | .. | 208 | .. |
| „ Sweden | 250 | .. | 250 | .. | 41174 | 4925 | .. | .. | .. | .. | 303 | 402 | 414 |
| „ Turkey | .. | .. | .. | .. | 8822 | 15505 | ... | .. | .. | .. | .. | .. | .. |
| „ India | 55 | .. | 55 | ... | 807610 | 749722 | 5 | 160385 | 61 | ... | 135723 | 64961 | 679 |
| „ Australia | 3945 | 212 | 4157 | .. | 10212489 | 8450966 | 60 | 25 | 6010 | 32136 | 2185 | 1830 | 1011 |
| „ America | . | .. | .. | 263142 | 604066 | 461687 | 47 | .. | 79828 | 10000 | 52124 | 51510 | 66563 |
| „ Africa | 10 | .. | 10 | . | 181454 | 84590 | .. | 187 | .. | .. | 10 | 4 | .. |
| „ China | 52 | . | 52 | 29353 | 534585 | 265271 | .. | .. | 40000 | .. | 487 | 4277 | 369 |
| „ Singapore | .. | 35 | 35 | .. | 35063 | 84446 | 599 | 200 | .. | .. | 37566 | 32921 | .. |
| „ Mauritius | .. | . | .. | .. | 11790 | 91810 | .. | .. | .. | .. | .. | .. | .. |
| „ Malta | .. | .. | .. | .. | 71510 | 114250 | . | .. | .. | .. | .. | .. | .. |
| Total exports from 1st Jan. to 26th Oct. 1897 | 17166 | 250 | 17416 | 611926 | 92705760 | | 24093 | 395964 | 2045657 | 806104 | 300857 | | 280973 |
| do 1896 | 18759 | 760 | 19519 | 1231359 | 86430522 | | 25902 | 274301 | 1818830 | 624332 | 262818 | | 279749 |
| do 1895 | 55388 | 3781 | 59169 | 836070 | 79726659 | | 23322 | 284310 | 1763864 | 641978 | 310168 | | 257126 |
| do 1894 | 24648 | 588 | 25236 | 2256232 | 69519831 | | 16440 | 230411 | 1587509 | 475090 | 385616 | | 279589 |

## MARKET RATES FOR OLD AND NEW PRODUCTS.

*(From Lewis & Peat's Fortnightly Prices Current, London, October 6th, 1897.)*

| | QUALITY. | QUOTATIONS. |
|---|---|---|
| ALOES, Soccotrine cwt. | Fair to fine dry ... | 44s a 120s |
| Zanzibar & Hepatic ,, | Common to good ... | 11s a 76s |
| BEES' WAX, ,, | | |
| Zanzibar & Bombay White ,, | Good to fine ... | £7 a £8 |
| Yellow ,, | Fair ... | £5 12/6 a £5 17/6 |
| Madagascar ,, | Dark to good palish . | £5 7/6 a £6 2/6 |
| CAMPHOR, China ,, | Fair average quality ... | 90s |
| Japan ,, | ,, ,, ,, | 102s 6d |
| CARDAMOMS, Malabar lb | Clipped, bold, bright, fine | 3s a 3s 1d |
| | Middling, stalky & lean | 2s 6d a 2s 9d |
| Ceylon.—Mysore ,, | Fair to fine plump .. | 2s 9d a 4s 1d |
| | Seeds ... | 3s 4d a 3s 5d |
| ,, Tellicherry ,, | Good to fine ... | 2s 9d a 3s |
| | Brownish .. | 2s 6d |
| ,, Long ,, | Shelly to good ... | 2s a 2s 9d |
| ,, Mangalore ,, | Med brown to good bold | 3s 6d a 3s 9d |
| CASTOR OIL, Calcutta ,, | 1sts and 2nds .. | 4d a 5d |
| Madras ,, | .. | 4d |
| CHILLIES, Zanzibar cwt. | Dull to fine bright .. | 35s a 45s |
| CINCHONA BARK.— Ceylon lb. | Ledgeriana Chips ... | 3¼d a 5d |
| | Crown, Renewed .. | 2d a 4½d |
| | Org. Stem... | 1¼d a 2½d |
| | Hybrid Root ... | 2¼d a 2½d |
| | Chip ... | 1¼d a 2d |
| CINNAMON, Ceylon 1sts per lb. | Ordinary to fine quill... | 10½d a 1s 6d |
| 2nds | ,, ,, ... | 10d a 1s 5d |
| 3rds | ,, ,, ... | 9½d a 1s 3d |
| 4ths | ,, ,, .. | 8½d a 1s |
| Chips | ,, ,, .. | 2½d a 3d |
| CLOVES, Penang lb. | Dull to fine bright bold | 4¼d a 9½d |
| Amboyna .. | Dull to fine .. | 3d a 4½d |
| Zanzibar and Pemba | Good and fine bright .. | 3d a 3½d |
| | Common dull to fair .. | 2¾d a 2⅞d |
| Stems .. | Fair .. | 1d |
| COCULUS INDICUS cwt. | Fair .. | 8s 6d |
| COFFEE Ceylon Plantation ,, | Bold to fine bold colory | 110s a 116s |
| | Middling to fine mid . | 103s a 108s 6d |
| | Low mid. and low grown | 95s a 101s |
| | Smalls ... | 9s3 a 98s 6d |
| Native ,, | Good ordinary ... | 65s a 89s 6d |
| Liberian ,, | Small to bold ... | 40s a 60s |
| COCOA, Ceylon ,, | Bold to fine bold ... | 72s a 76s |
| | Medium and fair .. | 63s a 70s |
| | Triage to ordinary .. | 45s a 55s |
| COLOMBO ROOT ,, | Fair to good .. | 20s a 32s |
| COIR ROPE, Ceylon ton | | nominal |
| Cochin ,, | Ordinary to fair .. | £10 a £16 |
| FIBRE, Brush ,, | Ord. to fine long straight | £10 a £21 |
| Cochin ,, | Ordinary to good clean | £15 a £21 |
| Stuffing ,, | Common to fine .. | £5 a £6 10s |
| COIR YARN, Ceylon ,, | Common to superior . | £12 a £26 10s |
| Cochin ,, | ,, ,, very fine ... | £12 a £34 |
| do. ,, | Roping, fair to good .. | £10 10s a £13 |
| CROTON SEEDS, sift. cwt. | Dull to fair ... | 50s a 60s |
| CUTCH ,, ,, | Fair to fine dry .. | 9s 3d a 32s 6d |
| GINGER, Bengal, rough ,, | Fair ... | 16s |
| Calicut, Cut A ,, | Good to fine bold ... | 70s a 95s |
| B & C ,, | Small and medium .. | 28s a 68s 6d |
| Cochin Rough ,, | Common to fine bold .. | 24s a 50s |
| | Small and D's ... | 10s a 24s |
| Japan ,, | Unsplit ... | 14s a 16s |
| GUM AMMONIACUM ,, | Sm. blocky to fine clean | 30s a 50s |
| ANIMI, Zanzibar ,, | Picked fine pale in sorts | £10 7s 6d a £13 |
| | Part yellow and mixed | £7 17/6 a £10 10s |
| | Bean and Pea size ditto | 70s a £7 12/6 |
| | Amber and dk. red bold | £5 10s a £7 10s |
| | Med. & bold glassy sorts | 80s a 137s 6d |
| Madagascar ,, | Fair to good palish .. | £4 8s a £8 |
| | ,, ,, red . | £4 5s a £9 |
| ARABIC E. I. & Aden ,, | Ordinary to good pale | 40s a 62s 6d |
| Turkey sorts ,, | | 56s a 85s |
| Ghatti ,, | Pickings to fine pale ... | 15s a 45s |
| Kurrachee ,, | Good and fine pale ... | 52s 6d a 65s |
| | Reddish to pale selected | 35s a 45s |
| Madras ,, | Dark to fine pale .. | 30s a 35s |
| ASSAFŒTIDA ,, | Clean fr to gd. almonds | 40s a 80s |
| | Ord. stony and blocky | 30s a 37s |
| KINO ,, | Fine bright .. | £45 a £55 |
| MYRRH, picked ,, | Fair to fine pale ... | 70s a 82s 6d |
| Aden sorts ,, | Middling to good .. | 33s a 57s 6d |
| OLIBANUM, drop ,, | Good to fine white ... | 34s a 60s |
| | Middling to fair .. | 20s a 31s |
| pickings ,, | Low to good pale ... | 11s a 12s 6d |
| siftings ,, | Slightly foul to fine ... | 9s 6d a 14s |
| INDIARUBBER, Assam lb | Good to fine ... | 1s 9d a 2s 4d |
| | Common to foul & mxd. | 3d a 1s 6d |
| Rangoon ,, | Fair to good clean ... | 1s 4d a 2s 2d |
| Borneo ,, | Common to fine .. | 1s 2d a 1s 9d |

| | QUALITY. | QUOTATIONS. |
|---|---|---|
| INDIARUBBER, (Contd). | | |
| Java, Sing. & Penang lb. | Foul to good clean ... | 1s a 2s 3d |
| Mozambique ,, | Good to fine Ball .. | 2s 2d a 2s 7½d |
| | Ordinary to fair Ball . | 1s 2d a 2s 2d |
| | Low sandy Ball .. | 10d a 1s 1d |
| | Sausage, fair to good . | 1s 9d a 2s 7½d |
| | Liver and livery Ball... | 1s 4d a 2s 3d |
| Madagascar ,, | Fr to fine pinky & white | 1s 11d a 2s 5d |
| | Fair to good black .. | 1s 6d a 1s 10d |
| | Niggers, low to good... | 1s a 1s 5d |
| INDIGO, E.I. ,, | Bengal— | |
| | Shipping mid to gd violet | 4s 4d a 5s 1d |
| | Consuming mid. to gd. | 3s 4d a 5s |
| | Ordinary to mid. good | 2s 10d a 3s 3d |
| | Mid. to good Kurpah... | 2s a 3s 6d |
| | Low to ordinary ... | 1s 3d a 1s 11d |
| | Mid. to good Madras... | 1s 1d a 2s 3d |
| MACE, Bombay & Penang per lb. | Pale reddish to fine ... | 1s 10d a 2s 9d |
| | Ordinary to fair ... | 1s 6d a 1s 9d |
| | Pickings .. | 1s 3½d a 1s 4d |
| MYRABOLANES, Madras cwt | Dark to fine pale UG... | 3s 9d a 5s 6d |
| | Fair Coast ... | 4s 6d |
| Bombay ,, | Jubblepore ... | 4s a 7s |
| | Bhimlies ... | 4s 3d a 9s |
| | Rhajpore, &c. .. | 3s 9d a 7s |
| Bengal ,, | Calcutta ... | 3s 6d a 5s 6d |
| NUTMEGS— lb. | 64's to 57's ... | 3s a 3s 2d |
| Bombay & Penang ,, | 110's to 65's ... | 1s 4d a 2s 11d |
| | 160's to 130's ... | 7d a 1s 1d |
| NUTS, ARECA cwt. | Ordinary to fair fresh... | 12s a 14s |
| NUX VOMICA, Bombay per cwt. | Ordinary to middling.. | 4s a 6s 6d |
| Madras | Fair to good bold fresh... | 7s a 7s 6d |
| | Small ordinary and fair | 6s 6d |
| OIL OF ANISEED lb | Fair merchantable ... | 8s 3d |
| CASSIA ,, | According to analysis.. | 5s a 7s 7d |
| LEMONGRASS ,, | Good flavour & colour... | 2⅝d |
| NUTMEG ,, | Dingy to white ... | 3¼d a 4d |
| CINNAMON ,, | Ordinary to fair sweet... | 4d a 1s 7d |
| CITRONELLE ,, | Bright & good flavour... | 1s 3d a 1s 3½d |
| ORCHELLA WEED—cwt | | |
| Ceylon ,, | Mid. to fine not woody... | 10s a 12s 6d |
| Zanzibar. ,, | Picked clean flat leaf ... | 10s a 15s |
| | ,, wiry Mozambique | 10s a 11s |
| PEPPER - (Black) lb. | | |
| Alleppee & Tellicherry | Fair to bold heavy ... | 3½d a 3⅝d |
| Singapore .. | Fair ... ... ... | 3 11-16d a 3¾d |
| Acheen & W. C. Penang | Dull to fine ... | 3¼d a 3⅜d |
| PLUMBAGO, lump cwt. | Fair to fine bright bold | 15s a 20s |
| | Middling to good small | 3s 6d a 13s |
| chips ,, | Dull to fine bright | 1s 6d a 8s 9d |
| dust ,, | Ordinary to fine bright | 2s a 6s |
| SAFFLOWER ,, | Good to fine pinky ... | 80s a 85s |
| | Middling to fair .. | 60s a 70s |
| | Inferior and pickings ... | 50s a 55s |
| SANDAL WOOD— Bombay, Logs ton. | Fair to fine flavour .. | £20 a £35 |
| Chips , | ... ... ... ... | 5s a £3 |
| Madras, Logs ,, | Fair to good flavour .. | £30 a £50 |
| Chips ,, | Inferior to fine .. | £4 a £8 |
| SAPANWOOD Bombay ,, | Lean to good ... | £4 a £5 |
| Madras ,, | Good average ... | £4 a £5 nom. |
| Manila ,, | Rough & rooty to good | £4 10s a £5 15s |
| Siam ,, | bold smooth... | £6 a £7 |
| SEEDLAC cwt. | Ord. dusty to gd. soluble | 70s a 80s |
| SENNA, Tinnevelly lb. | Good to fine bold green | 4d a 7d |
| | Fair middling medium | 2½d a 4½d |
| | Common dark and small | 1½d a 2d |
| SHELLS, M. o'PEARL— Bombay cwt. | Bold and A's ... .. | £5 2/6 a £6 |
| | D's and B's ... ... | £5 a £6 5s |
| | Small ... ... ... | £4 7/6 a £5 |
| Mussel ,, | Small to bold ... | 20s a 67s 6d |
| TAMARINDS, Calcutta... per cwt. | Mid. to fine bl'k not stony | 7s a 8s 6d |
| Madras | Stony and inferior .. | 4s a 6s |
| TORTOISESHELL— Zanzibar & Bombay lb. | Small to bold dark mottle part heavy | 18s a 25s |
| TURMERIC, Bengal cwt. | Fair ... ... | 10s a 10s 6d |
| Madras ,, | Finger fair to fine bold | 16s a 17s |
| Do. ,, | Mixed midlng. [bright | 12s a 13s |
| Do. ,, | Bulbs .. .. .. | 12s |
| Cochin ,, | Finger .. .. .. | 12s 6d |
| | Bulbs ... .. .. | 7s 3d |
| VANILLOES— lb. | | |
| Mauritius and Bourbon ... 1sts | Gd. crysallized 3½ a 9 in. | 22s a 30s |
| 2nds | Foxy & reddish 4½ a 8 ,, | 17s a 26s 6d |
| Seychelles 3rds | Lean and inferior .. | 12s a 16s |
| VERMILION lb. | Fine, pure, bright ... | 2s 2d |
| WAX, Japan, squares cwt. | Good white hard ... | 41s |

# THE AGRICULTURAL MAGAZINE, COLOMBO.

*Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."*

The following pages include the Contents of the *Agricultural Magazine* for November :—

Vol. IX.] NOVEMBER, 1897. [No. 5.

## SEASON REPORTS FOR SEPTEMBER.

W*ESTERN Province.*—Paddy. Yala harvest nearly over, a good Maha is expected, but prospects would have been better if excessive rains had not spoiled them. Rainfall all over above the average. Fruits and vegetables not as plentiful as usual.

*Central Province.*—Paddy. Yala harvest over, and sowing, transplanting, weedings, &c., in progress; crop prospects good. Rainfall in Matale 7·40 in. Health of cattle good.

*Northern Province.*—Paddy. Sowing, and preparation for sowing Kalapokam going on. Rainfall 4·86 in. in Jaffna, 3·25 in. in Mannar.

*Southern Province.*—Paddy. Yala harvest going on or over. Preparations in progress for Maha. Rainfall 11·37 in. in Galle.

*Eastern Province.*—Paddy. 6,000 acres in Kalmunai under Pinmari were partially submerged, 2,500 other acres in fine condition. Good crop in Trincomalee district. Rainfall in Batticaloa 7·53 in. and 10·35 in. in Trincomalee. Murrain still prevalent in parts of Batticaloa district.

*North-Western Province.*—Paddy. Yala crop being reaped, and Maha sowing commenced. Murrain still exists in the province. 12,000 bushels of paddy are expected from the Yala harvest of Pitigal Korale, central division, and 5,182 bushels have been sown for the Maha. Rainfall in Puttalam ·91 in.

*North-Central Province.*—(Not received.)

*Province of Uva*—Paddy. Maha harvest over, yield middling. In Wellassa a scarcity of food is reported owing to failure of last year's chena crops.

*Province of Sabaragamuwa.*—Paddy. Yala harvest over, good in Kegalle district but damaged by rain in the Ratnapura district. Maha cultivation has also suffered owing to excessive rain. No cattle murrain reported. Rainfall at Ruanwella 14·76 in.

## RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF OCTOBER, 1897.

| | | | | | |
|---|---|---|---|---|---|
| 1 | Friday .. | ·30 | 17 | Sunday .. | Nil |
| 2 | Saturday .. | ·16 | 18 | Monday .. | Nil |
| 3 | Sunday .. | Nil | 19 | Tuesday .. | Nil |
| 4 | Monday .. | ·28 | 20 | Wednesday .. | Nil |
| 5 | Tuesday .. | Nil | 21 | Thursday .. | Nil |
| 6 | Wednesday .. | Nil | 22 | Friday .. | Nil |
| 7 | Thursday .. | Nil | 23 | Saturday .. | Nil |
| 8 | Friday .. | ·15 | 24 | Sunday .. | Nil |
| 9 | Saturday .. | Nil | 25 | Monday .. | Nil |
| 10 | Sunday .. | Nil | 26 | Tuesday .. | Nil |
| 11 | Monday ... | Nil | 27 | Wednesday .. | 1·53 |
| 12 | Tuesday .. | Nil | 28 | Thursday .. | Nil |
| 13 | Wednesday .. | Nil | 29 | Friday .. | 1·06 |
| 14 | Thursday .. | ·07 | 30 | Saturday .. | ·54 |
| 15 | Friday .. | ·53 | 31 | Sunday .. | Nil |
| 16 | Saturday .. | Nil | 1 | Monday .. | Nil |
| | | | | Total .. | 4·32 |
| | | | | Mean .. | ·19 |

Greatest amount of rainfall in any 24 hours on the 27th, Wednesday, 1·53 inches.

Recorded by A. R. JEREMIAH.

## RAMIE FIBRE.

The visit of Mr. J. M. Macdonald, of Messrs. Macdonald, Boyle & Co., London, to Ceylon last month should, if anything will, give an impetus

to Ramie cultivation in the Island. The excitement in connection with this much-discussed fibre—about which, perhaps, more has been written than any other plant, fibrous or otherwise—that was evinced some two years ago, waned as rapidly as it waxed, and the chief reason assigned for this was the technical difficulties that arose in the disposal of the produce. These difficulties, however, Mr. Macdonald brushes aside by his recommendations that the material to be exported should take the form of filasse to be prepared by means of a machine in which he is interested. The degummed and treated fibre, we are informed, will readily command £42 in England, while the cost of producing a ton (at 1½d. per lb.) should not exceed £14, that is to say there should be a profit of some £28 on every ton produced. Taking 1½ tons as what Mr. Macdonald considers a safe estimate per acre, this will represent a profit—when the estate is in full bearing,—that is from the second year—of £42 per acre. Deducting the royalty of 25% on the net working profits due to the patentees, there will be left a clear profit of £32 per acre on the enterprise.

In comparing Mr. Macdonald's estimates with those of other writers, we should bear in mind the method of planting which he recommends, namely, putting the cuttings 1'×1' apart at first, or 43,560 to the acre, and afterwards taking away every other plant, so reducing the number permanently to 10,190 per acre. In a letter written just before leaving Ceylon, Mr. Macdonald says: "Get 40 tons (that is of stems free from leaves) per acre and Ramie begins to pay, but nothing under 30 tons will pay." Taking £32 as the profit per acre with a field of say 60 tons of sticks, the profit will be proportionately reduced to £21 per acre with a yield of 40 tons, and to £16 with a yield of 30 tons. But Mr. Macdonald bases his original cultivation on larger acreages; with smaller plantations the cost of producing a lb. of prepared fibre may be expected to be greater, so making the profits smaller; and Mr. Macdonald gives R25 as a fair average profit per acre. Hitherto it has been customary to grow ramie 4 or 5 feet apart. Now, if we compare the number of plants in an acre put 2'×2' apart and the number per acre put 4'×4' we find that there are nearly 8,000 plants more per acre in the former case, so that the method of planting advocated by Mr. Macdonald upsets all previous calculations as to the amount of produce per acre and makes his own estimates unique. It may be said that there is a certain limit to the productive power of an acre of land, and that the amount of produce varies within certain limits which Mr. Macdonald's estimates overstep on the higher side. It may further be said that it is a bad system of agriculture which recommends close planting with the object of getting more produce. This latter statement applies of course with great force to fruit-bearing crops as we know so well in the case of the coconut palm. But the ramie is a stem-bearing crop, and we also know that when trees are planted close they tend to grow spindly, and in the case of a branching tree that the tendency to branching is in a degree suppressed, whereas with plenty of light and air surrounding it the tree will grow more symmetrically, developing proportionately in a lateral direction as it grows in height. But in the ramie shrub the tendency to send up straight and tall stems without any lateral branches is a decided advantage, for the longer and straighter the stems and the fewer the side shoots the better the fibre. Indeed, in the cultivation of the plant it is necessary to remove all lateral foliage buds in order to preserve the continuity of the fibre in the stems. So that by growing the plants close together, beside the advantages of the weeds being kept down and the ground shaded—for ramie does not stand drought well—we as it were force the plant to produce long straight stems of the most acceptable form. This close planting of ramie has certainly thrown a new light on the method of cultivation which, as we have shown, most materially affects the quality and quantity of the fibre and also nullifies all previous calculations as to yield and profit.

As regards the cutting of sticks, Mr. Macdonald advises that this should go on almost continually, so that the sticks fit for cutting will be gathered at the proper time. Periodical cuttings he deprecates on the same grounds that periodical pickings of tea leaf are to be deprecated. There is no doubt that continual cuttings of ramie would result in the production of a more uniform quality of fibre. Mr. Macdonald estimates that one man can go over two acres in a day cutting the mature stems.

The chief point it seems to us in embarking on a new planting industry such as this is to discover the most suitable localities for cultivation. Ramie wants a loam or clay loam (not too heavy) and the more atmospheric moisture the better. Dry sandy soils are objectionable, but on the other hand land inclined to be water-logged is to be avoided.

The plan adopted by the patentees of recovering the royalty on their machines is certainly novel and speaks well for their certain faith in the prospects of ramie cultivation; for when they demand a percentage on the net profits of cultivation they at once identify themselves with the success or failure of the industry. If ramie cultivation succeeds, the patentees secure their royalty; if it fails they lose it. That is certainly a very fair bargain.

On the whole we confess to be favourably impressed with the prospects of ramie, and we feel justified in advising local growers—particularly those already engaged in cultivation and with spare land available—to give it a fair trial on a moderate scale, and according to the methods of culture advocated by Mr. Macdonald. If there is no central degumming factory now, we fancy it must come before very long, and those who have their reserves of ramie will then be able to launch into extensive cultivation after, of course, having satisfied themselves by a tentative measure that they were justified in so doing. With them it will be "first come first served" *by* the factory, and *to* the £42 per ton which is so temptingly offered.

## OCCASIONAL NOTES.

The visit of Mr. Macdonald of Ramie fame has aroused a new interest in the cultivation of this well-known fibre plant, and we are inclined to think has also engendered a certain amount of confidence in the new industry. There was some talk about our having got the wrong variety of the plant. We will not here enter upon the discussion of the botanical difference between Rhea and Ramie, suffice it to say that Mr. Macdonald has stated that we have got the correct sort which could be easily identified by the white-back leaves that characterize the true Ramie. We should therefore abandon the word "rhea" for "ramie," as in this instance there is a good deal in a name.

We may state for the information of our readers that Ramie fibre cuttings can be had either at the School of Agriculture or from Messrs. Clarke, Young & Co., at Rs. 20 per 1,000 cuttings one foot long. We shall be glad to show the specimens of fibre, thread, and cloth prepared from ramie—which were given to us by Mr. Macdonald—to anyone who may desire to inspect them.

Arrangements which had been made for a first excursion-class of agricultural students, when the Henaratgoda Gardens were to be visited, had to be abandoned owing to the irregularity of the train service as a result of the big rock slip on the line.

We have to thank Messrs. Freudenberg & Co. for samples of the following manures:—Blood-meal, Kainit, Basic Slag and Sulphate of Potash, as well as for a number of pamphlets treating of the properties and uses of these fertilizers. We hope to make reference to the manures in their relation to Ceylon crops, in a future issue. In the meantime we would only say that the fact of Messrs. Freudenberg & Co. having brought these fertilizers into the local market must prove a great convenience to growers—at least to those who are wise enough to think of reducing their manure bill by replacing their stock compounds with the equivalent of more cheaply mixed fertilizing agents.

We are glad to have among our numerous exchange that most acceptable and up-to-date journal, *The Australian Tropiculturist,* for which we thank the Editor. We are greatly obliged to Messrs. Hynde & Stark of Zomba B.C. Africa for their letter of the 26th August, and are pleased to know that our magazine reaches them. P. G. S.'s letter from Mildura, Victoria, received.

## INSTRUCTION IN AGRICULTURE.

In his Administration Report for last year, Mr. W. E. Davidson, Assistant Government Agent of the Province of Sabaragamuwa expresses his views on Agricultural Education—with reference specially to the case of the native cultivator—and indicates the directions in which he thinks the School of Agriculture should work:—

"What we ask from the Agricultural School and the Royal Botanical Gardens is (1) that the Superintendent and Director should guide us when we want information; (2) that we should be supplied with seeds and young plants when we want them; and (3) that the Superintendent of the Agricultural School, or a really competent assistant from the school or from Henaratgoda or Peradeniya, should deliver special popular lectures on any new garden development. *E.g.*, this year we want in Four Korales to have all the information we can get on (1) the growing and preparing of rhea fibre; (2) the preparation of the tanning material in the green arecanut, and an analysis of the increased profit to be derived from preparing the product locally. Again, this year and next in Three Korales I want the whole country to hear all the facts and figures about plantain culture, so as to have their produce properly cultivated and ready for the railway to carry it to the market. If Mr. Drieberg can prepare popular lectures on these points with lemelight illustrations and such-like attractions, I will guarantee to find twenty audiences in selected neighbourhoods, and the net advantage to the country will in one season exceed all the advantages derived from any attempt at local school training. In fine, from my point of view, the one benefit derivable by this district from the appointment of an Agricultural School in Colombo is that the Superintendent, or a competent assistant, should deliver locally popular lectures on popular subjects. He should fulfil the same functions as are discharged by a "County Council" lecturer, *e.g.*, as in Sussex.

"The subject is fully discussed in my reports of the 2nd December, 1895, and of the 16th February, 1897.

"In the same reports I have reviewed the history of the attempts to introduce new paddy, *e.g.*, muttusamba, pulukhamban, and Carolina, and of barley; of new garden fruits such as pomegranate, mandarin orange, Madagascar papaya, pomeloe, loquat, jambu, guava, and the Cochin goraka; and of new commercial products, such as tea, Liberian coffee, cacao, cotton, cloves, pepper, and rhea fibre. The growing of rhea fibre promises to develop into a cottage industry."

We have not had the pleasure of reading the two reports referred to by Mr. Davidson in which he has fully discussed the subject of Agricultural Instruction, for though, curiously enough, we receive the Agricultural reports and papers published in India and most of the British Colonies, we are not supplied with the local publications bearing directly on the agriculture of the Island.

Nearly all the suggestions made by Mr. Davidson were embodied in the scheme which was drawn up by the Superintendent of the School of Agriculture for the re-organising and better equipping of the school and for carrying on the work of the Agricultural Branch of the Educational Department on more practical lines. This scheme was appended to his annual report for 1896, and reprinted in the September number of

the Agricultural Magazine. The additional suggestion that the lectures in the provinces should be illustrated with limelight views and other attractions is a very practical idea. When it is remembered that a sum of nearly R9,000 is being saved by the withdrawal of Agricultural Instructors and other measures of retrenchment, it might reasonably have been expected that some alternative and more practical programme of work for the improvement and extension of native agriculture would be adopted, but so far no action has been taken in this direction. The views of so experienced an official as Mr. Davidson, who has been giving more than the ordinary attention of a revenue officer to native agriculture, coming also when the scope of working the Agricultural School has been diminished, ought we fancy to prove acceptable to Government and help towards the drafting of a scheme which would make the most of the material available in the school. We would advise further that in connection with the proposed lectures, there should also be demonstrations as far as possible, at the time of and in illustration of the lectures, and later also in a more practical way out of doors, and even literally in the field. Such practical demonstrations are always given in connection, for instance, with the itinerating dairy classes in England. There is nothing like going to the very doors of native cultivators to reach them. What we want is an agricultural campaign, so to speak, in the villages.

In his last Administration Report the Director of Public Instruction refers to the good work being done by Mr. Lewis, the Sub-Inspector of Schools in the Central Province. Mr. Lewis may be called an old boy of the School of Agriculture, where he acted for a long period as a master. We have a vivid recollection of his enthusiasm in all that pertains to the betterment of native agriculture, and can well imagine his making the most of his opportunities as an Inspector of Schools—who is *par excellence* a provincial grandee—to preach on the means available to the native cultivator for improving his status and prospects, and not merely to preach but to see that his precepts are put into actual practice by, for instance, growing such new products; the seeds and plants of which Mr. Lewis himself would supply them with.

Now we are inclined to think that Mr. Lewis' self-imposed duties provide an admirable example for imitation, for if his work is fruitful and commendable, why should not the School of Agriculture adopt the same course and work on the same lines as he pursues,—only on a wider scale. An Inspector of Schools is a busy man with little time to deviate from the road that leads from one school to another, and his agricultural skirmishes must necessarily be confined to his line of route and to school centres: but we take it that schools are not so numerous in this country, nor are they always the most convenient coigns of vantage from which to attack the agricultural labourer. The neighbourhood of schools may, we confess, be assumed to be the most enlightened centres of rural life, and therefore the people in such localities may be supposed to be capable of readily assimilating the teachings of enlightened agriculture. But we would proceed further and work deeper, and, as we said, go to the very doors and fields of the agricultural labourer in making not mere skrimishes, but in carrying on a well-planned campaign, in which the impedimenta would be represented by seeds and plants, models and maps, machines, diagrams, *et hoc genus omne* so far as relates to agriculture.

In India—in connection with the Saidipet College, for instance—we know that a special feature of the practical work is the going among the cultivators, studying their needs and ministering to the wants, whether they lack information and instruction or such material requirements as seeds and plants. Dr. Morris, in a late address on Tropical Agriculture in Jamaica, is reported to have declared that there is nothing which "promises to be more widely appreciated by the mass of cultivators or calculated to be of more permanent benefit than the plan of sending agricultural instructors to advise and encourage them."

We think we have written enough to show that before any good may result from the teaching of the School of Agriculture its work must be made of a more practical character. Some will say that lecturing the people is not a very practical way of teaching them, but by lecturing we do not mean the declamation of the class-room lecturer, but a method of speaking to the people not merely in words, but by illustration and practical demonstration and all the available means of effectually appealing to all the five senses of an individual. Personal contact with the masses is what is necessary in order to influence them, no matter in what direction, and until some such programme of work as has been recommended by Mr. Davidson and which is supported (as we have shown) by so many independent authorities, is adopted, the question will continue to be asked, as it has been so often asked during the past year:—"What good has come out of the Agricultural School?"

## FRUIT CULTURE.

*(Continued.)*

But after all the French pebble drain which we have described, however great an improvement it may be on open channels or no drainage at all, is far from being perfect, inasmuch as it is comparatively a make-shift affair, which requires periodical cleaning out. The most perfect and satisfactory though costly system is undoubtedly the laying down of permanent drain tiles. These, when properly laid, outlast several generations and carry off the water with three or four times the certainty and swiftness of the French drain, while they never clog. Instances are numerous where by this means large areas of worthless "drowned" land, in which cattle could not venture without risk, has been converted into productive market farms.

The gospel of trenching and draining is a hard one; it means considerable outlay long before a return can be expected. To minimise this and attain a certain sort of success, though

not the best, the total expenditure might be spread over a number of years.

Thus an orchard of say 20 acres upon a gentle slope may be trenched up in strips of land straight down the incline with a drain alongside each strip. For example, let the first strip laid out be 20 ft. wide and the drain to follow. The next plot of 20 ft. is ploughed up in the first year and used for a catch crop. In the second year it is trenched up exactly as was No. 1. Next to this comes the 3rd plot trenched up at the same time as No. 1. Then comes a second line of drain followed by plot No. 4 treated as was No. 2 for a first year's catch crop and a second year's trenching. And thus the alteration goes on over the whole area. By this means about half the cost of completely trenching an acre to be devoted to fruit culture would be distributed over perhaps two or three years.

The time of trenching is the best time for manuring if the natural poorness of the soil requires that assistance. The old method of putting a bushel of manure near the foot of the tree will not do at all. The manure must be scattered with the aid of a six-pronged fork so as to diffuse it pretty evenly throughout the whole mass of trenched-up soil. If your supply runs short reserve it for the upper two feet of soil instead of working it deeper, and if you have a still shorter supply you will have to be very sparing. You will find it more thrifty to leave the top surface of your land rough. Then scatter what manure you have over the rough surface and turn it in when you finally level it down to a cultivable smoothness. Practically this amounts to a top-dressing only. When working with a clayey soil, manure that is not particularly rich in animal matter, but contains much of incompletely decomposed straw find its best use in aëration and preventing the packing together of the soil. We are apt to look upon manuring as a sort of cure all, which with the help of a copious water supply is to save the labour of trenching up the soil, pruning the trees to a fruitful condition, and looking well after them generally. Have we not given them plenty of compost? Then why don't they bear satisfactorily? The fact is the majority of fairly fertile soils that have been industriously cultivated will suit fruit trees without other manure than a light top-dressing, for years, if only they get the inevitable and necessary opening up by trenching. Heavy manuring is the cultural need of annual crops, which have to spring up, blossom and seed at racing speed, to get through with their short lives within the year. Your fruit trees do not take life so fast, and they therefore don't require the stimulus appropriate to cereals where work is done in 5 or 6 months.

(*To be continued.*)

## THE MANIOC PLANT.

Dr. R. H. Grenning, who in 1874 addressed the Secretary of State for India on the subject of inducing the people of India to freely cultivate Manioc, especially among their hedgerows, so that the trees may serve as an alternative foodstuff in seasons of scarcity and famine, has again taken up the question in connection with the present famine in India. Dr. Grenning, who writing last year, describes himself as "blind and in indifferent health and in my 79th year" believes that manioc tubers will prove a valuable stand-by when other crops are killed by drought, and refers to them as "a God-ordained food for drought and famine" which will be the means of saving millions of pounds and millions of lives. Livingstone calls it the staff of life in Africa, while in Brazil, Chili, Peru and Central America it is a universal food, and it is a curious fact, says Dr. Grenning, that in these countries we never hear of famines though there are often very long droughts.

Two species of manioc are recognised, one with a sweet root *(M. Aipi)* and the other *(M. utilissima)* bitter and poisonous from containing prussic acid in its juice. The poisonous properties of the latter are, however, easily got rid of by squeezing out the juice or by heating. The poisonous kind differs from the other by having its leaves and the summits of the branches darker, and the roots have a purple hue beneath the cuticle which is wanting in the sweet kind. But the easiest test is to taste the broken roots; one is sweet like almonds, the other bitter and repulsive. The Brazilian arrowroot of commerce is nothing else than the starch (known as "polvilho") from manioc. Dr. Grenning believes that manioc, which has practically the same composition as rice will exactly replace it in the economy of the native Indian during times of scarcity. He writes thus enthusiastically in a letter to Lord Lorne:—"Men like Stanley, Selous, Bishop Tucker and others who know much of Africa, could assist and bear testimony to the thesis that manioc is God's natural provision against drought and famine, and is the secret means of saving people when drought destroys rice and other kinds of food."

The Superintendent of Botanic Gardens, N. W. P., India, reporting on Dr. Grenning's scheme says that manioc is extensively cultivated in Bengal, and is also well-known in the Madras and Bombay Presidencies. It is not raised as a commercial crop as it cannot compete with the potato and sweet potato and so does not pay. The Superintendent of Botanic Gardens, Calcutta, does not believe in the drought-withstanding properties of manioc, and states that it would fail as a food crop in seasons when rice also fails for lack of moisture.

Another authority on the subject is Mr. Robert Thompson, who writing from Lan Cayetano, Columbia, mentions that some 20 varieties are known in cultivation there, and that the plant could be grown from sea-level to full 6,000 feet. He then goes on to say that its peculair and most commendable merit consists in its capacity to flourish in regions not only where prolonged droughts are experienced, but also in comparatively desert regions. Under favourable conditions as much as 25 lb. is procurable from one plant, but allowing an average of five pounds per plant, ten tons per acre would result if they are planted a yard apart.

It has been said that in most parts of India the manioc is not in favour with the people.

But the plea for manioc-growing is not as a principal crop, but as a stand-by in times of drought, during which periods the question of satisfying the palate must be secondary to the cravings of the stomach; besides, it is well-known that in seasons of scarcity the poorer classes have to resort to all forms of vegetable products, with which at ordinary times they would spurn to appease their hunger.

The State of Travancore would seem to be the only place in India where manoic is cultivated at all systematically, and "Tapioca Cultivation in Travancore" is the subject of an interesting paper by Mr. A. M. Sawyer which appeared in *The Indian Forestor*, Vol xxi, pages 290—296. We have, however, written more than we intended for the present issue on the subject of manioc, and must reserve any reference to a epitome of Mr. Sawyer's paper for another issue, when we shall also deal with the cultivation of manioc in the Island.

## ARECANUT PREPARATIONS.

Dr. Watt gives the following methods of treating Arecanuts for the market in India:—In some cases after the nuts are husked they are boiled till soft; the slices are rubbed with the inspissated water in which the nuts are boiled, which become impregnated with the astringent principle contained in the nuts; the slices are then dried in the sun, and in this condition sent to market. Again, instead of being sliced and boiled the nuts are sold entire. In other places (Manipur) they are sold in the streets with the husk neatly opened up like a fringe to show that the nuts are fresh. In the Bombay and Mysore *Gazetteers* interesting details are given regarding the methods of preparing the nuts for the market. In Thana the growers sell the nuts wholesale to a tribe called Vánis, who by different treatment, prepare six classes of nuts. To prepare *phulbardi supári* or those with flower-like fissures, the nuts are gathered when yellow but not quite ripe. The husk is stripped off and the kernels are boiled in milk or water in an earthen or tinned copper vessel. When the nuts grow red and the water or milk thickens like starch, the boiled nuts are removed and dried in the sun for seven or eight days. The red *tambdi* arecanuts are prepared by boiling ripe fruits stripped of husk in milk or water with a small quantity of pounded Kath (Catechu), lime and betel leaves. As soon as the boiling is over, the nuts and boiling milk or water are removed in a basket with a copper vessel under it to catch the droppings. To make *Chikni* or tough betel-nut, the nuts are gathered when they are beginning to ripen, and when the boiling is over the catechu-like substance left on boiling is rubbed over the nuts, when they are dried in the sun. This process is repeated until the nuts grow dark red. To make *Lavangachuri* or clove-like nuts, the kernels of tender fruits are cut into clove-like bits, and after boiling in water are dried in the sun. *Pandhri* or white nut is prepared by boiling the ripe fruits with the husk and afterwards drying in the sun till the husk is easily removed. To prepare *dagdi* or strong nut the fruit is gathered when ripened into hardness, and after stripping it of the husk, it is boiled and dried in the sun. To make *Kápkadi* or cut nut, the kernels are cut out of the nut when tender and dried in the sun without being boiled or soaked in water. In Mysore after removing the husk the nuts are boiled in water, then cut into pieces and dried in the sun; or they are first cut into pieces, then boiled in water with catechu and leaves of the betel vine and afterwards dried in the sun, when they are fit for sale.

*Extract.*—The water in which arecanuts are boiled becomes discoloured and thick; this on being inspissated forms *Kossa* or the catechu of the greatest astringency; but the best catechu of a red colour is obtained by boiling in fresh water the nuts which have been previously boiled.

The ripe fruit is boiled for some time in an earthen or tinned copper vessel and the nuts together with the boiling water are poured over a basket. The boiled water is caught in a tinned copper vessel and is allowed to thicken of itself or thickened by boiling into a black very astringent catechu. Sometimes these nuts are boiled a second time in fresh water, when the boiled water gives a yellowish brown catechu. The refuse after boiling is sticky and is used for varnishing wood and for healing wounds.

Chemists, after examining into the chemical character of the seed, have come to the conclusion that *catechin* is not a constituent of arecanuts, and that any extract made from them must be essentially different to the catechu of the acacia, and is rather to be considered a kind of tannic matter of the nature of *Ratanhia-red* or *Cinchona-red*. It is interesting to learn further that incineration of the seed produced 2·26 per cent of ash, which, besides peroxide of iron contained phosphate of magnesia.

## BISULPHIDE OF CARBON FOR PRESERVING STORED GRAIN.

We have lately been consulted as to the best means of preserving paddy from the attack of weevils, and among other remedies recommended bisulphide of carbon. This is the chemical which is now most commonly used against *Calandra granaria* and *Calandra oryzæ*.

We find in that useful publication, *The Agricultural Journal* of the Cape, full and clear instructions given by the Government Entomologist as to the method of using bisulphide of carbon, and we reprint them for the benefit of our readers.

Bisulphide is commonly considered to be a dangerous explosive, but there is no danger to be apprehended from its use if it be kept out of the reach of fire.

Carbon bisulphide has for a number of years been acknowledged as the simplest, most effective and least expensive of the many agencies recommended and used for the destruction of weevils and other grain-infesting insects. As supplied by chemists, it is a colourless liquid which, owing to impurities almost invariably present to some extent, possesses a penetrating and exceedingly vile odour not unlike the stench from a decomposed egg. The liquid rapidly changes to a heavy vapour when exposed to the air at ordinary temperatures, and to this property is largely due its utility as an insecticide.

The vapour is very inflammable and highly poisonous to animal life.

To *ensure* success the grain to be treated should be in a bin with tight sides and bottom, but the treatment of grain even in open cribs is reported to be successful by the Mississippi Agricultural Experiment Station, where experiments in the use of this insecticide were conducted for many years.

The chemical is placed in shallow dishes or on pieces of cotton waste or other absorbent material on the surface of the grain, or is even sprinkled directly on the surface of the grain. If there is a depth of more than five feet of grain in the bin, it is well to put part of the charge well into the mass either by pouring it in through a tube or by burying material soaked in it. After distributing the charge, the bin is usually covered with blankets or other heavy cloths to shut off the air; the fumes, however, being so much heavier than air, cannot escape upwards to any great extent. The liquid soon evaporates, and the fumes, descending, penetrate to all portions of the mass of grain, carrying death to all insect and other animal life.

If the bin is tight, the charge need not be over one pound of the bisulphide to each forty bushels of grain; one pound to each hundred bushels is said to be used with success at the experiment station alluded to above. It is customary to leave the grain exposed to the fumes for at least twenty-four hours. A longer exposure does not injure the grain for milling purposes, but an exposure of more than two days affect its germinating powers. After opening the bin, the fumes gradually pass off, although if the bin is very tight it may be necessary to stir the grain or even throw it out of the bin.

If the grain is in open bins and much affected by weevils, it may be desirable to repeat the treatment in six or eight weeks, particularly if the conditions of temperature are favourable for the rapid propagation of the insects; under favouring conditions of heat the common grain weevil (*Calandra granaria*, Linn.) passes through a generation during this period. It is also sometimes desirable to have the room in which the grain is stored or even the whole building fumigated, in which case the space should be made as tight as possible and not less than one pound of bisulphide evaporated for each one thousand cubic feet. Many mill owners in America periodically fumigate their entire buildings. The bisulphide is distributed about in shallow vessels or on absorbent material as is done when grain in the bin is treated. Because of the disagreeable and poisonous nature of the fumes and their tendency to sink to the lowest level, it is customary, when there is more than one floor, to begin the distribution on the ground-floor and to work upwards, making the exit from the top floor.

While carbon bisulphide is poisonous to all kinds of animal life if inhaled in quantities, the amount breathed by a man in handling and distributing it is insufficient to do him any harm. The only real danger from the substance is its *inflammability*, and care must be taken to prevent anyone approaching where it is being used with a flame of any sort; even a lighted pipe or cigar is dangerous. If this precaution is observed, there is no cause for anxiety.

Cape Town chemists sell carbon bisulphide at 2s. per pound in small quantities and generally at a slight reduction from this price when ten pounds or more are taken. The demand for it is small and no dealer carries very much in stock. It is not unlikely that if one is likely to require much, it would pay to import a quantity direct from England or the United States on his own account. Edward R. Taylor, Manufacturing Chemist, Cleveland, Ohio, U.S.A., makes a specialty of carbon bisulphide for fumigation purposes, and for several years has been supplying a very satisfactory grade which he calls "Fuma Bisulfide"; this he sells at 10 cents (about 5d.) per pound in fifty pound drums. From New York, the carriage on goods to South African ports is said to be even less than from London, so it might prove a good investment to some grain dealers to make a trial of importing a few fifty pound drums from him.

## THE VITALITY AND DISSEMINATION OF SEEDS.

(*Continued.*)

As to how long seeds carefully preserved retain their vitality, and the power of germination remains, there is little precise and reliable information, though attempts have often been made to solve the question. The labours of Danberry, Henslow and Lindley afford much material for reflection, having been conducted in a methodical and painstaking way, whilst their labours extended over a long series of years.

More is known of the seeds of cultivated species, for, being articles of trade, merchants make a careful study of a matter so closely affecting their interests. Coffee seeds, in order to grow, require to be sown immediately after ripening. On the other hand, melon seeds have been said to retain their vitality for upwards of 40 years. (Balfour, *Manual of Botany.*) The last example could only apply if the seed was preserved under special conditions, not exposed to the air. It is acknowledged that seeds of the Brassica family, (to which belong mustard, cabbage &c.) will germinate when 10 years of age, though a less percentage of growths arrive after the 6th year. Many gardeners maintain that the progress of certain vegetables is more regular, more gradual, with less chance of running away to bloom prematurely, when the seed is 2 years of age than when it is threshed from the pod. On the contrary, should conditions adverse to germination prevail, such as drought, or should mischievous insects abound, then new seed has a decided advantage as possessing more moisture and strength. The story of wheat produced from the Egyptian pyramids, and which was supposed to have been placed there at the time of the burial of the mummy, tests the credulity of the scientist as well as that of the husbandman. *De Candolle in his Origin of Cultivated Plants*, confesses that he does not believe in the so-called mummy wheat, which the Count of Stenburg is credited with growing at Prague, and which is supposed to have produced a new race of wheat. He states that the Arabs slip modern seeds into the tombs (even maize, an American plant) for the purpose of imposing upon visitors!

Mr. William Carruthers mentions an authentic case of the seeds of the sacred Lotus (*Nelumbium speciosum*) which were known to have been more than a hundred years in the British Museum, being grown by Robert Brown. Difference in germinating, says Carruthers, are mainly due to difference in the structure of the testa or outer covering of the seed. Where the testa, as in most cereals, is thin and soft, the dessication of the seed is rapid, but where hard and compact, the seed is protected from the air and the embryo is preserved in a living condition for a longer period. Thus the seeds of *Canna indica* and *Asparagus plumosus* have a very tough covering, and the only way to release the embryo is to boil or nearly boil them for 3 or 4 hours.

Some writers on horticulture as well as botanists have drawn up tables to guide gardeners as to the age at which seeds will germinate. These are interesting as giving different opinions, but as not being of any great practical value we do not reproduce the lists of Beecher, Watkins, and M. de Vilmorin. The last writer, referring to germination, says that the duration of the germinating faculty depends greatly on the condition more or less favourable under which the seeds have been harvested or preserved. Nothing contributes more to destroy seed than the influence of humidity and heat; these are difficulties which are encountered when seed has to be sent to tropical regions. There is no better means of preserving seeds than to put them into linen bags in a dry airy place.

When attention is called to the vitality of the seed of those indigenous plants called weeds, our experience is more at fault, and serious difficulties arise. How long will seed survive which have been buried deep below the surface where light and air cannot penetrate? It is a common experience to find the seeds of weeds lying dormant until again exposed to the elements, or brought within a reasonable distance of the top, and noxious annuals and biennials frequently reappear where such plants have been allowed to mature and ripen their seed, leaving a legacy for many successive seasons. It is obvious that no obnoxious plant should be allowed to reach maturity, as a few specimens are sufficient to poison a field.

Rhind in his *Vegetable Kingdom*, referring to the fecundity of plants, writes as follows:—

"The fecundity of plants, in other words, the astonishing number of germs or seeds which they produce, is one of the causes which are most powerful in facilitating their reproduction, and in affecting their surprising multiplication. A single capsule of the white poppy has been known to contain 8,000 seeds, and a capsule of the *Vanilla* from 1,000 to 1,500; a single stalk of *Zea Mays*, Indian corn or maize, will produce 2,000 seeds; a single plant of tobacco has been found, by calculation, to possess the almost incredible number of 360,000, and a single stalk of spleenwort has been thought, by estimation, to produce at least a million seeds."

Why does the seed lie idle so long in the ground, and in a dormant or lifeless condition? Without sufficient moisture to saturate and soften the seed germination does not commence. As long as the seed is excluded from oxygen no movement need be expected, even if other conditions are favourable. In the case of seed under deep water this has been often exemplified. Again, a moderate temperature must exist, or seeds will not sprout. Some grain will start at a much lower temperature than others, but this does not generally apply, and different species need different degrees of heat according to the nature and temperament of the plant. The common and coarser indigenous plant will of course always have the advantage over the tender and cultivated one

## VETERINARY WORK IN CEYLON.

### I.—*The Prevention and Suppression of Contagious Disease.*

During 1896 the Island has been comparatively free from disease.

*Western Province.*—During the first half of the year cattle plague and foot-and-mouth disease existed in and around Hanwella. It was suppressed and the Province was free for the remainder of the year.

Cattle Return for the Western Province, 1896.

| | | |
|---|---|---|
| Number of cattle:— | | |
| Buffaloes | ... ... | 31,904 |
| Black cattle and other breeds | | 127,865 |
| Number affected by disease:— | | |
| Buffaloes | ... ... | 4,683 |
| Black cattle and other breeds | | 13,026 |
| Supposed nature of disease: Principally foot-and-mouth disease. | | |
| Recoveries | ... ... ... | 14,937 |
| Deaths | ... ... ... | 1,780 |

*Central Province.*—There were outbreaks of murrain in three villages of Yatinuwara and two villages of Tumpane, in Kandy District, during July and August. The villages were proclaimed infected areas. The proclamation regarding Yatinuwara was revoked in December, the disease having disappeared; that regarding Tumpane was still in force at the end of the year.

There was an outbreak of hoof disease in Udapalata in August, and certain villages were proclaimed infected areas. Cases of hoof disease were reported from Pahala Hewaheta, Pata Dumbara, Harispattu, Yatinuwara, and Tumpane, and of sore mouth from Pata Dumbara and Harispattu. The outbreak was not severe, and it was not considered necessary to take steps under the Ordinance.

Matale.—Cattle murrain was prevalent in Warakamura and Purijjala in Matale South during the months of June to August, 1896. Three buffaloes and seven head of black cattle in Warakamura and four head of black cattle in Purijjala were attacked with the disease. Of these, one buffalo in Warakamura and one head of black cattle in Purijjala recovered, and the rest died. The disease was reported to have been introduced into Warakamura by some cattle brought for sale from Kunchuttu Korale of the North-Central Province. Prompt measures were taken and the spread of the disease was checked. Only one other case of murrain was reported from Aluwihara, about two miles from the town. Foot-and-mouth disease prevailed in almost all parts of the district, but no animals died from it.

Nuwara Eliya.—There was no murrain during the year. There was foot-and-mouth disease in

almost every village of the district. Only a few cases proved fatal.

Cattle Return for the Central Province, 1896.

Number of cattle :—

| | |
|---|---|
| Buffaloes ... ... | 42,387 |
| Black cattle and other breeds | 43,064 |

Number affected by disease :—

| | |
|---|---|
| Buffaloes ... ... | 4,178 |
| Black cattle and other breeds | 4,950 |

Supposed nature of disease : Foot and-mouth discase and murrain.

| | |
|---|---|
| Recoveries ... ... ... | 7,669 |
| Deaths ... .. ... | 1,459 |

*Northern Province.*— MANNAR : In January and February a purging sickness prevailed amongst black cattle and buffaloes in the Iluppaipadavaip Pattu, and 27 cattle died out of 52 attacked, the rest recovering. The disease is believed to have been introduced from the adjacent Vanni villages where murrain was prevailing.

About the same time somes cases of foot-and-mouth disease occurred at Kannarponnai, but no mortality was reported. The cattle were quite healthy during the rest of the year owing to the good supply of water and pasture.

Cattle Return for the Northern Province for 1896.

| District. | Number of Cattle. | | Number affected by Disease. | | Nature of Disease | Recoveries | Deaths. |
|---|---|---|---|---|---|---|---|
| | Buffaloes | Black Cattle or other Breeds. | Buffaloes | Black cattle or other breeds | | | |
| Jaffna ... | 2,421 | 137,996 | 418 | 813 | Murrain | 218 | 1,013 |
| Mannar ... | 9,206 | 25,214 | 31 | 21 | Purging | 25 | 27 |
| Mullaittivu ... | 5,362 | 3,442 | ... | .. | .. | ... | .. |
| Vavuniya .. | 5,605 | 4,647 | 368 | 140 | Murrain | 80 | 428 |
| Total ... | 22,594 | 171,299 | 817 | 974 | ... | 323 | 1,4[illegible]8 |
| | 193,893 | | | | | | |

*Southern Province.*—Foot-and-mouth disease prevailed to some extent in July in the Four Gravets and Wellaboda Pattu, in September in the Four Gravets and Talpe Pattu, and in October in Bentota-Walallawiti Korale. There was no serious loss.

*Eastern Province.*—There were no cases of cattle murrain in this Province during 1896. Hoof-and-mouth disease prevailed all over the Batticaloa District and in the town of Trincomales and Kaddukulam Pattu, though not of a virulent type, and there were no cases of death from the disease.

*North Western-Province.*

| Place. | Number of Animals infected with Murrain. | Number of Animals infected with Foot-and-mouth disease |
|---|---|---|
| Hiriyala hatpattu ... | Nil ... | Nil |
| Weudawili hatpattu ... | Nil ... | Nil |
| Wanni hatpattu ... | Nil ... | Nil |
| Dewamedi hatpattu ... | 37 ... | Nil |
| Katugampola hatpattu ... | 629 ... | Nil |
| Dambadeni hatpattu ... | 339 ... | Nil |

CHILAW DISTRICT.—Cases of murrain were reported in July as having occurred in Pulichchakulam, but the animals were isolated and the disease did not spread. Cases of murrain were also reported from Millawa, Potuwatawana, and Kahatawala in the southern division. The disease was supposed to have been introduced by animals purchased from the North-Central Province. 19 head of cattle were attacked, but 3 only died, and the disease did not spread further. No cases of murrian were reported from the central division.

Cases of foot-and-mouth disease occurred in all three divisions, but no deaths seem to have followed.

PUTTALAM DISTRICT.—There has been little hoof-and-mouth disease within this district. The only imported outbreak was in Chenakudiyiruppu within the gravets of Puttalam in July, when 34 cases were reported. None of the animals attacked died. The village in question has an imported cattle trade, most of the animals being brought from the north. As regards murrain, Akkarai Pattu south, which connects Kalpitiya peninsula with the mainland, has been the worst sufferer. There was a sharp outbreak lasting through October and November, during which period 99 animals were reported attacked, chiefly at the important village of Kattakadu. In Demala Hatpattu, Peravili, and Pandita Pattus, which adjoin the Puttalam-Kurunegala road, have suffered rather badly. The disease is supposed to have been introduced into Pandita Pattu from Wilachchiya Korale in Anuradhapura. Puttalam Pattu itself has been singulary free, as only seven cases were reported.

Of the animals attacked, about 100 were buffaloes, the rest black cattle. The annexed statement shows the loss in each division :—

| Pattu. | Affected. | Died. |
|---|---|---|
| Puttalam (January) ... | 7 | 3 |
| Pandita (January to April) ... | 29 | 3 |
| Peravili (August to November) ... | 57 | 29 |
| Akkarai south (October to November) | 99 | 47 |
| Total ... | 192 | 82 |

*North-Central Province.*—Murrain has been prevalent in this Province throughout the year: during the first four months it existed in the Nuwaragampalata and Tamankaduwa district to a great extent. About the end of April Tamankaduwa was freed from it, and nothing but a few cases of foot-and-mouth disease during the second half-year troubled that district again. In Nuwaragampalata the disease continued throughout the year, although not with the severity of the first half-year. In Hurulupalata and Kalagampalata the disease has broken out at places now and again, but not to the extent of the other two divisions. Hoof-and-mouth disease has prevailed only in Nuwaragampalata and the Meda Pattu of Tamankaduwa, but it has not been much noticed.

Cattle Return for the N.-C. Province for 1896.

| District. | Number of Cattle. | | Number affected by Disease. | |
|---|---|---|---|---|
| | Buffaloes. | Black Cattle and other Breeds. | Buffaloes. | Black Cattle and other Breeds. |
| Nuwaragampalata .. | 18,300 | 13,800 | 4,000 | 2,000 |
| Hurulupalata .. | 16,559 | 20,126 | 223 | 118 |
| Kalagampalata .. | 9,482 | 7,480 | 427 | 89 |
| Tamankaduwa District | 2,338 | 4,450 | 85 | 120 |
| Total .. | 46,679 | 45,856 | 4,735 | 2,327 |
| | 92,535 | | | |

Cattle Return for the North-Central Province for 1896.—*(Contd.)*

| District. | Supposed Nature of Disease. | Recoveries. | Deaths. |
|---|---|---|---|
| Nuwaragampalata .. | Murrain and hoof-and-mouth disease. | 1,500 | 4,500 |
| Hurulupalata .. | Murrain | 186 | 155 |
| Kalagampalata .. | Murrain | 150 | 366 |
| Tamankaduwa District | Purging and sores on hoof and mouth. | 110 | 95 |
| Total .. | — | 1,946 | 5,116 |

*Uva.*—Foot-and-mouth disease prevailed all over the Province during the year.

Cattle Return for the *Province of Sabaragamuwa* for 1896.

| District. | Number of Cattle. | | Number affected by Disease. | |
|---|---|---|---|---|
| | Buffaloes. | Black Cattle and other Breeds. | Buffaloes. | Black Cattle and other Breeds. |
| Ratnapura .. | 19,960 | 19,558 | 2,450 | 4,123 |
| Kegalla .. | 22,523 | 16,686 | 6 | 21 |
| Total .. | 42,483 | 36,244 | 2,456 | 4,144 |
| | 78,727 | | | |

| District | Supposed Nature of the Disease. | Recoveries. | Deaths. |
|---|---|---|---|
| Ratnapura .. | Hoof-and-mouth disease and purging | 4,513 | 2,060 |
| Kegalla .. | Murrain | 10 | 17 |
| Total .. | — | 4,523 | 2,077 |

The information detailed above was received from the Government Agent of each Province. During the latter part of the year I requested returns to be furnished to me in the form in which the return from the Northern Province is rendered. It was found not possible to give exact details for 1896, but the most reliable information has been given, and complete returns in the form indicated will be compiled for 1897 and be rendered half-yearly. Foot-and-mouth disease appears to have given considerable trouble. Fortunately there has been no serious loss. It may be classed as a mild disease, and large numbers of deaths should not occur if the animals are carefully attended. The treatment for this disease has been several times published in official reports and in the public press.

## GENERAL ITEMS.

For several years past Prof. Hummel of Leeds has been working on the dyes and tans of India, and recently, in conjunction with Mr. A. G. Perkin, who has submitted each dye to a critical chemical analysis, a most valuable series of papers has been published on Indian dyeing materials. Sir F. Abel, Director of the Imperial Institute, writing to Dr. Watt with reference to the labours of Prof. Hummel, says "he sends me a list of eight (dyestuffs) which are sufficiently rich in colouring matter to render them worthy of examination both chemically and tinctorially in preference to others." The following is the list in which the dyes are arranged in the order of their tinctorial value:—Myrica Nagi (bark), Delphinium Zalil (flowers), Carpesium abrotanoides (whole plant,) Nyctanthes Arbor-tristis (flowerl tubes), Kandelia Rheedii (wood), Gossypium herbaceum (flowers), Thespesia populnea (flowers), and Mangifera indica (bark). It will be seen from this list of Indian dyes that all but the first three are familiar trees in Ceylon.

Mr. G. E. Dugmore, writing to the Grahamstown Journal, urges upon cattle-owners the importance of inoculating their herds against rinderpest. He says: "I can give names if necessary; one man out of 70 has not one left, another out of over 200 has 19 left, another out of 50 has 3 left, another out of 40 has one left, and another out of 146 has 26 left. Where inoculation has been carefully done while the herd was healthy the results have been as follows:—Out of 278, 4 dead; out of 160, no loss; out of 490, 5 dead; out of 200, 5 dead. These I have had from thoroughly reliable men. They have all been inoculated twice, and are now doing it a third time, and I could multiply instances indefinitely. How long the immunity will last we do not know, but the following is thoroughly established: Get the disease and without inoculation, losses are 99 per cent; get the disease and then inoculate, losses 50 to 80 per cent; inoculate with good bile before herd is affected, and losses will be *nil* to 5 per cent.

The following is given as the approximate average analysis of the fresh orange as calculated by Prof. Earle of the Florida Experimental Station, the average being take from 15 varieties analysed by him:—

| | |
|---|---|
| Moisture ... ... | per cent 87·33 |
| Nitrogen ... ... | ·121 |
| Organic matter exclusive of nitrogen ... | 11·55 |
| Silica ... ... | ·010 |
| Sulphuric acid ... | ·043 |
| Phosphoric acid ... | ·082 |
| Ferric oxide ... ... | ·005 |
| Lime ... ... | ·232 |
| Magnesia ... ... | ·048 |
| Potash ... ... | ·508 |
| Soda ... ... | ·041 |
| Chlorine ... ... | ·011 |